APPENDIX A

Charmac Trailers, Twin Falls
Tier II Operating Permit and Permit to Construct
No. T2-020412

Emission Estimates by Charmac Trailers

HE

Tetra Tech EM Inc.

106 N 6th Street, Suite 202 ◆ Boise, ID 83702 ◆ (208) 343-4085 ◆ 343-4756 (Fax)

February 18, 2003

Mr. Tom Anderson
Air Quality Permit Engineer
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

RE: Revised air quality impact analysis for Charmac Trailers Tier II Operating Permit (Permit Completeness Determination number T2-020412)

Dear Mr. Anderson:

I have attached the revised air quality impact analysis modeling documentation required for the Charmac Trailers Tier II Operating Permit.

The revised modeling addresses the following issues that were identified during our discussions:

- Documentation of PM_{10} modeling input concentrations
- Paint booth #1 exhaust vent to be modeled with vertical exhaust vent
- Correct paint booth stack exit diameters
- Welding and natural gas to be modeled as area sources
- Requirement to model NO_X emissions

If you have any questions, please feel free to contact me at (208) 343-4085.

Sincerely,

Doug Herlocker

Doug Herlocker

cc: Lloyd Casperson, Charmac Trailers

Attachment

REVISED AIR QUALITY IMPACT ANALYSIS FOR CHARMAC TRAILERS TIER II OPERATING PERMIT (PERMIT COMPLETENESS DETERMINATION # T2-020412) FOR THE IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

CHARMAC TRAILERS
452 South Park Avenue West
Twin Falls, Idaho 83303

Prepared By

TETRA TECH EM INC
106 N. 6th Street, Suite 202
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February 18, 2003

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1.0 REVISED AIR QUALITY IMPACT ANALYSIS

This revised dispersion modeling analysis has been prepared for the Idaho Department of Environmental Quality (IDEQ), Air Quality Program to demonstrate compliance with the State of Idaho air quality standards in support of a permit application for Charmac Trailers (Charmac).

The revisions include using the Industrial Source Complex Plume Rise Model Enhancements model (ISC-PRIME) instead of Industrial Source Complex Short Term Model (ISCST3) for the modeling analysis. Emissions from sources that were previously classified as insignificant in the original submittal were added into the modeling for the revised analysis. Additionally, an updated receptor grid was used in this analysis to reflect the receptor spacing recommended by IDEQ. The following sections describe the revisions in more detail.

1.1 MODEL SELECTION AND SETUP

Based on IDEQ recommendations, the revised dispersion modeling was conducted using ISC-PRIME. ISC-PRIME incorporates model algorithms that are considered next generation for evaluating building downwash effects. These algorithms, along with enhanced plume rise algorithms, have been incorporated into the latest version of the ISCST3, and the revised model has been named ISC-PRIME. ISC-PRIME can be used for source-specific analysis of complicated sources. A complicated source is one with more than one emission point, aerodynamic downwash, dry and wet deposition, or volume and area sources. ISC-PRIME is a steady-state Gaussian plume model that is appropriate for estimating pollutant concentrations at distances to 50 kilometers, and for averaging times from 1 hour to 1 year.

ISC-PRIME was used to predict maximum pollutant concentrations in ambient air from the paint booth, space heater, and welding emissions at Charmac. Emissions from the space heaters and welding are described in Section 1.2 of this document. The predicted concentration values were then compared to the National Ambient Air Quality Standards (NAAQS) for PM_{10} and Idaho Acceptable Ambient Concentrations (AAC). ISC-PRIME was run using all the regulatory default options including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and without use of gradual plume rise. The model was run using rural dispersion coefficients.

1.2 SOURCE INPUT DATA

Emission sources at the Charmac facility consist of three paint booth vents, 32 natural gas space heaters, and six welding stations. Fumes from the paint booths are vented out of the painting buildings via vertically oriented vents that are located near the top of the buildings. Paint Booth # 1 has one square vertical exhaust vent that measures 4 feet (ft) by 4 ft. Paint Booth # 2 has two horizontal exhaust vents measuring 4 ft by 3 ft each. The exit velocities from the Paint Booth # 2 vents were modeled using 0.01 meters per second instead of the actual exit velocities to account for the horizontal orientation of the vents. All three vents are rectangular, so an effective stack diameter was determined for each vent. The area of the vent opening was calculated based on vent dimensions. That area was then assumed to be circular, and an effective diameter was calculated. The exhaust temperature from each of the vents is the same as the temperature inside the building, which is kept at 68 ° Fahrenheit.

Emission rates from the paint booth vents were calculated for PM_{10}, HAPs, and TAPs as shown in Section 3 of this permit application. Particulate emissions were calculated for white primer because this paint contains more particulates than the other paints. HAPs and TAPs emissions were compared to the Idaho screening emission levels (EL) on a pounds per hour (lb/hr) basis. All the screened toxics, except aluminum, calcium carbonate, and potassium hydroxide, are emitted at rates less than the screenings EL and do not require modeling analyses. Table 1-1 presents source emission rates and stack parameters used to model PM_{10}, aluminum, calcium carbonate, and potassium hydroxide emitted from the point source paint booth vents. All emission calculations are based on Charmac's potential to emit these pollutants.

PM_{10} emissions rates from paint booth vents A, B, and C were calculated to be 0.0391 gram/second (g/sec), 0.0391 g/sec and 0.0781 g/sec, respectively. The PM_{10} emission rates are presented in Table 1-1 and are based on the following three equations:

(1) $7.6\ ^{\text{lb solid}}/_{\text{gal}} \times 6.81\ ^{\text{gal}}/_{\text{hr}} \times 2$ (spray guns) $\times$ 30% (overspray) $\times$ 4% (solids not captured) $= 1.24\ ^{\text{lb PM10 solid}}/_{\text{hr}}$

(2) $1.24\ ^{\text{lbPM10 solid}}/_{\text{hr}} \times\ ^{1\text{ hr}}/_{60\text{ minute}} \times\ ^{1\text{ minute}}/_{60\text{ sec}} \times\ ^{1\text{ g}}/_{0.0022\text{ lb}} = 0.1563\ ^{\text{g}}/_{\text{sec}}$

(3) $0.0391\ ^{\text{g}}/_{\text{sec}} + 0.0391\ ^{\text{g}}/_{\text{sec}} + 0.0781\ ^{\text{g}}/_{\text{sec}} = 0.1563\ ^{\text{g}}/_{\text{sec}}$

TABLE 1-1
SOURCE EMISSIONS AND STACK PARAMETERS FOR POINT SOURCES

Paint Booth #2 Paint Booth #1

Model Parameter	Vent A	Vent B	Vent C
Stack UTM Location (mE/mN)	706270/4713751	706280/4713751	706268/4713732
Stack Height (m)	4.57	4.57	4.88
Stack Temperature (K)	293	293	293
Stack Exit Velocity (m/sec)	0.01	0.01	0.01
Stack Diameter (m)	1.191	1.191	1.376
PM_{10} (g/sec)	0.0391	0.0391	0.0781
Aluminum Emission Rate (g/sec)	0.1181	0.1181	0.1181
Calcium Carbonate Emission Rate (g/sec)	0.1926	0.1926	0.1926
Potassium Hydroxide Emission Rate (g/sec)	0.0493	0.0493	0.0493

Notes:
mE/mN meters East / meters North
m meters
K Degrees Kelvin
m/sec meters per second
g/sec grams per second
UTM Universal Transverse Mercator

Emissions from the natural gas heaters and welding operations were calculated using AP-42 emission factors. These sources were modeled as area sources. The number of natural gas heaters and welding stations located in each of the buildings on Charmac's property varies. Each building was modeled as an area source, and the emission rates associated with these area sources depended on the number of natural gas heaters and welding stations located in each building. Even though the natural gas heaters and welding operations are located inside buildings, no emission controls were taken into account for this when emissions were calculated. The modeled area source emissions represent worst-case conditions and are very conservative.

NO CONTROL EFFICIENCY TAKEN FOR BUILDING

Table 1-2 presents source emission rates and stack parameters used to model NO_2 and PM_{10} area sources.

TABLE 1-2
SOURCE EMISSIONS AND STACK PARAMETERS FOR AREA SOURCES

Area Source Name	Area UTM Location (mE/mN)	Release Height (m)	X Dimension of Area Source (m)	Y Dimension of Area Source (m)	Angle of Rotation (degrees)	PM_{10} (g/s-m²)	NO_x (g/s-m²)
HEAT_3A	706273/ 4713680	6.10	12.19	12.19	NA	9.25E-07	7.90E-06
HEAT_3B	706273/ 4713694	6.10	42.67	30.48	NA	9.25E-07	7.90E-06
HEAT_4	706220/ 4713770	6.10	42.72	33.53	NA	4.37E-07	3.74E-06
HEAT_5	706339/ 4713690	6.10	10.65	121.86	347	1.44E-06	1.23E-05
HEAT_6	706220/ 4713738	9.14	9.15	15.24	NA	2.89E-06	2.47E-05
WELD_3A	706273/ 4713680	6.10	12.19	12.19	NA	1.78E-07	NA
WELD_3B	706273/ 4713694	6.10	42.67	30.48	NA	1.78E-07	NA
WELD_4	706220/ 4713770	6.10	42.72	33.53	NA	1.68E-07	NA
WELD_5	706339/ 4713690	6.10	10.65	121.86	347	1.98E-07	NA

Notes:
mE/mN meters East / meters North
m meters
g/s-m² grams per second per square meter

1.3 BUILDING DOWNWASH

Input to the ISC-PRIME model included building dimensions to assess the potential for downwash effects from nearby structures. ISC-PRIME includes several advances over ISCST3 in estimating building downwash effects, including enhanced dispersion in the wake, reduced plume rise due to streamline deflection and increased turbulence, and a continuous treatment of near and far wakes (Schulman et al. 1998). The direction-specific downwash parameters were calculated using facility plot-plan maps, and Building Profile Input Program (BPIP) software, which is the building downwash program associated with the ISC-PRIME model. Output from BPIPPRM was incorporated into the ISC-PRIME modeling input files.

1.4 MODEL RECEPTORS

Three separate receptor groups were constructed for the ISC-PRIME analysis of area surrounding the Charmac facility. First, receptors surrounding the Charmac fence line at 25-meter (m) intervals were added. Next, a rectangular grid of receptors was used from the project fence line boundary extending outward for 4 kilometers (km) in each direction. Spacing between these receptors was dependant on distance from the Charmac fence line: receptors were spaced at 25 m intervals within 100 m of the Charmac fence line; receptors were spaced 500 m between 100 m and 4 km from the Charmac fence line. Figure 1-1 shows the revised receptor grid relative to the Charmac facility.

1.5 MODEL RESULTS

ISC-PRIME modeling was completed assuming worst-case, 24-hour operating conditions for PM_{10}, aluminum, calcium carbonate, and potassium hydroxide and worst-case annual operating conditions for NO_2 and PM_{10}. Potential impacts of PM_{10} are less than the 24-hour and annual NAAQS of 150 microgram per cubic meter ($\mu g/m^3$) and 50 $\mu g/m^3$, respectively. Established 24-hour and annual background PM_{10} concentrations for the Twin Falls area are 55 $\mu g/m^3$ and 26 $\mu g/m^3$, respectively. These background concentrations were then added to the modeled results and are shown below:

- 24-hour concentration = 101.6 $\mu g/m^3$
- Annual concentration = 38.7 μg/m3

Based on the model results, potential impacts of NO_2 are less than the annual NAAQS. Potential impacts of aluminum, calcium carbonate, and potassium hydroxide from the paint booth vents at Charmac are all less than the AAC established in the Idaho Administrative Procedures Act (IDAPA) 58.01.01. The maximum modeled annual NO_2 concentrations occurred during 1989. The high and second-high 24-hour PM_{10} concentrations occurred during meteorological year 1991, and the maximum modeled annual PM_{10} concentrations occurred during 1990. The maximum modeled 24-hour aluminum, calcium carbonate, and potassium hydroxide concentrations occurred during 1991. Tables 1-3 and 1-4 summarize the ISC-PRIME modeling results of each pollutant for each model year. Figure 1-2 shows the annual NO_2 contours for 1989. Figures 1-3 and 1-4 show 24-hour and annual PM_{10} contours for 1991 and 1990, respectively. Figures 1-5 through 1-7 show modeled toxics concentration contours for the 24-hour averaging period during the 1991 meteorological year.

All electronic modeling files used in this analysis are provided in Appendix A.

Figure 1-1
Revised Receptor Grid for Charmac Trailers

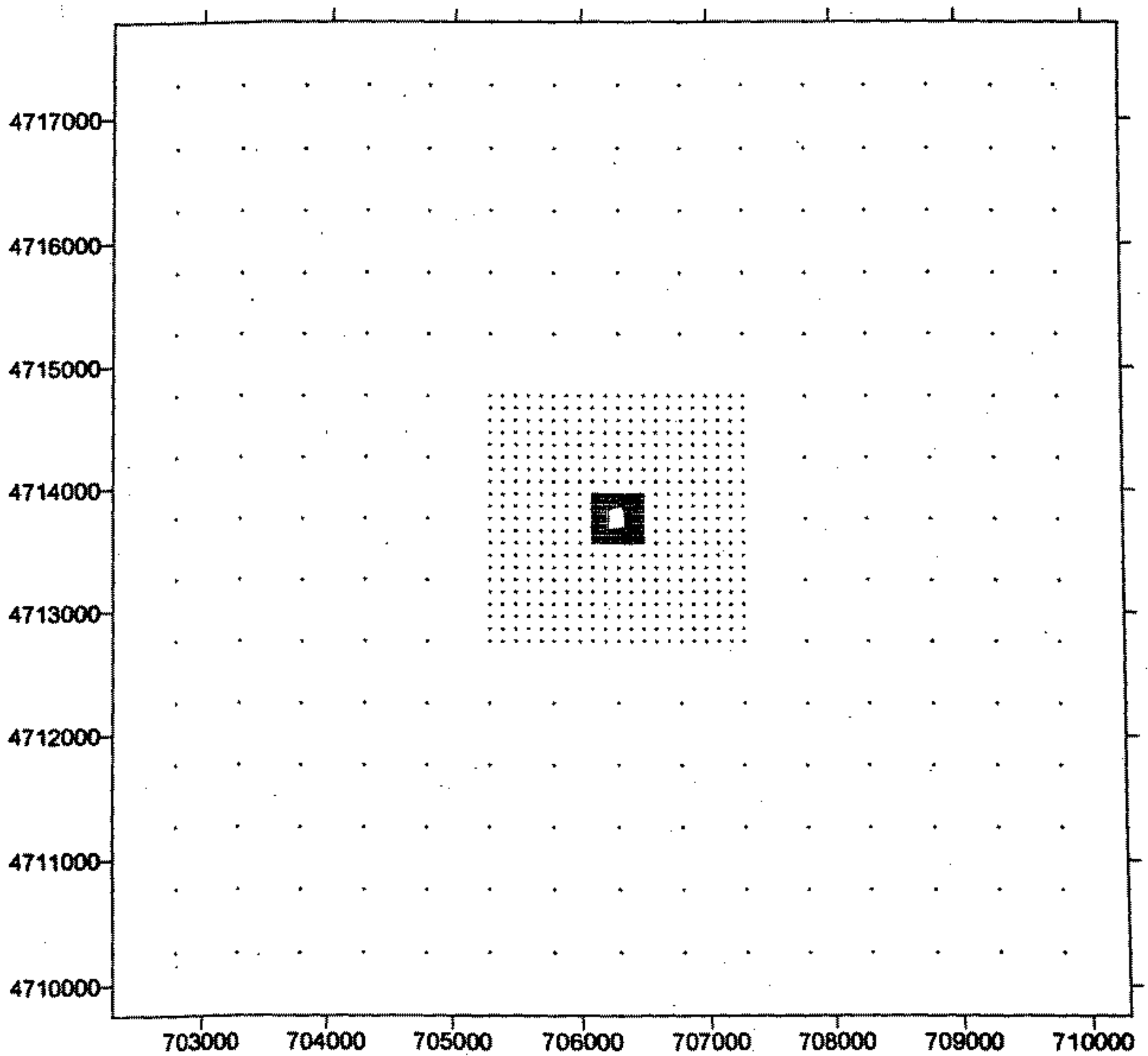


TABLE 1-3

MODELED 24-HOUR AND ANNUAL CONCENTRATIONS FOR NO_2 AND PM_{10}

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	UTM Location (mE/mN)
1987 Meteorological Data				
NO_2	Annual	1.37	100	706165/4713834
PM_{10}	24-hour	41.85	150	706215/4713783
	Annual	12.57	50	706215/4713761
1988 Meteorological Data				
NO_2	Annual	1.39	100	706165/4713834
PM_{10}	24-hour	38.15	150	706215/4713783
	Annual	12.46	50	706215/4713761
1989 Meteorological Data				
NO_2	Annual	1.41	100	706165/4713834
PM_{10}	24-hour	44.59	150	706215/4713783
	Annual	12.74	50	706215/4713783
Modeled result plus background concentration	Annual	**12.74 + 26 = 38.7**	**50**	**NA**
1990 Meteorological Data				
NO_2	Annual	1.39	100	706165/4713834
PM_{10}	24-hour	40.48	150	706215/4713761
	Annual	12.67	50	706215/4713761
1991 Meteorological Data				
NO_2	Annual	1.37	100	706390/4713659
PM_{10}	24-hour	46.60	150	706215/4713783
Modeled result plus background concentration	24-hour	**46.60 + 55 = 101.6**	**150**	**NA**
PM_{10}	Annual	12.61	50	706215/4713761

Notes:
mE/mN — meters East / meters North
$\mu g/m^3$ — micrograms per cubic meter
NA — Not Applicable

TABLE 1-4
MODELED 24-HOUR CONCENTRATIONS FOR ALUMINUM, CALCIUM CARBONATE, AND POTASSIUM HYDROXIDE

Pollutant	Maximum 24-Hour Concentration (µg/m³)	AAC (µg/m³)	UTM Location (mE/mN)
1987 Meteorological Data			
Aluminum	198.98	500	706215/4713783
Calcium Carbonate	324.50	500	706215/4713783
Potassium Hydroxide	83.06	100	706215/4713783
1988 Meteorological Data			
Aluminum	184.29	500	706215/4713783
Calcium Carbonate	300.54	500	706215/4713783
Potassium Hydroxide	76.93	100	706215/4713783
1989 Meteorological Data			
Aluminum	222.04	500	706215/4713783
Calcium Carbonate	362.10	500	706215/4713783
Potassium Hydroxide	92.69	100	706215/4713783
1990 Meteorological Data			
Aluminum	182.80	500	706215/4713761
Calcium Carbonate	298.12	500	706215/4713761
Potassium Hydroxide	76.31	100	706215/4713761
1991 Meteorological Data			
Aluminum	239.18	500	706215/4713783
Calcium Carbonate	390.05	500	706215/4713783
Potassium Hydroxide	99.84	100	706215/4713783

Notes:
mE/mN meters East / meters North
µg/m³ micrograms per cubic meter

6

Figure 1-2
NO2 Annual Modeling Results for Meteorological Year 1990

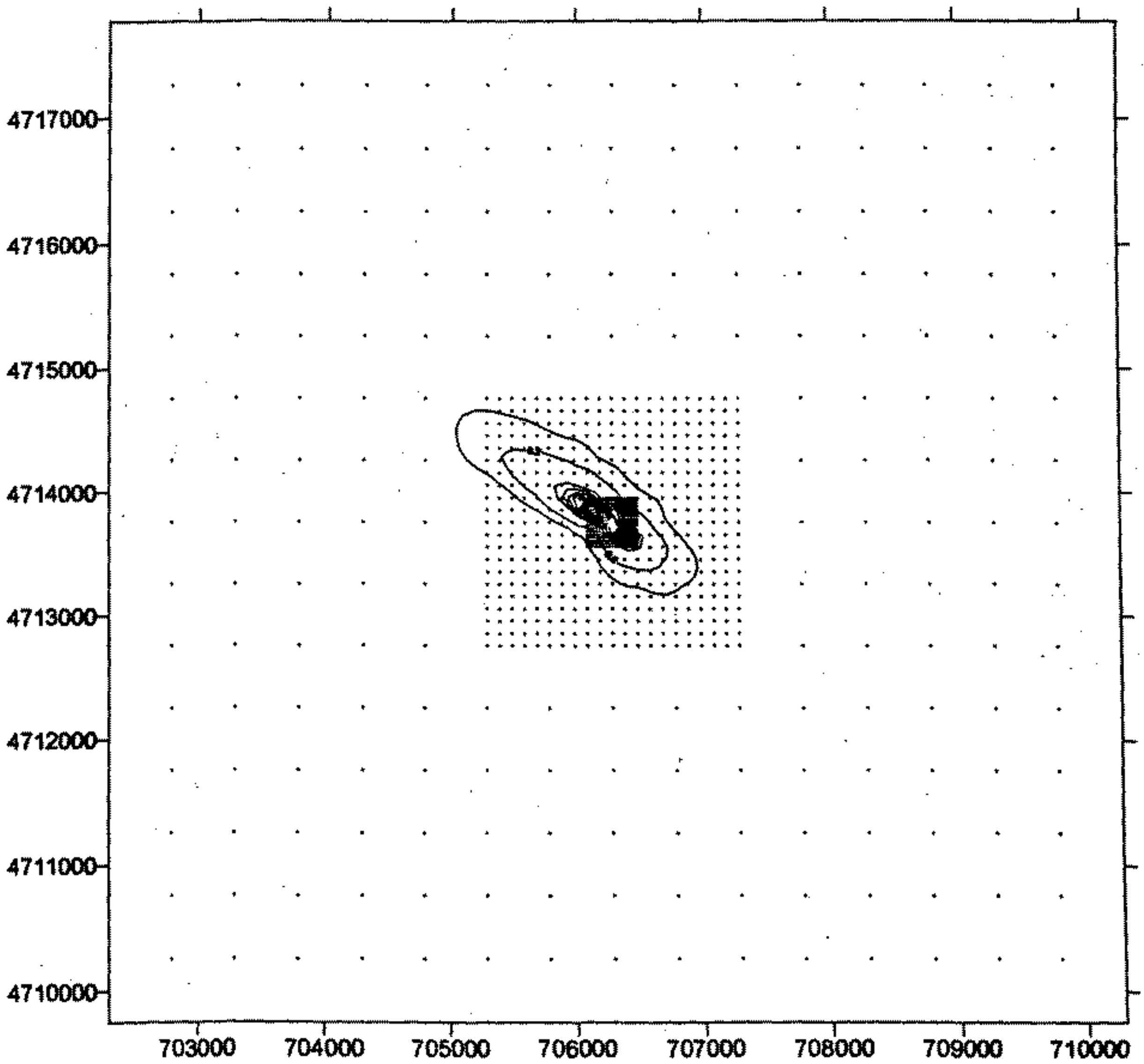


Figure 1-3
PM-10 24-Hour Modeling Results for Meteorological Year 1991

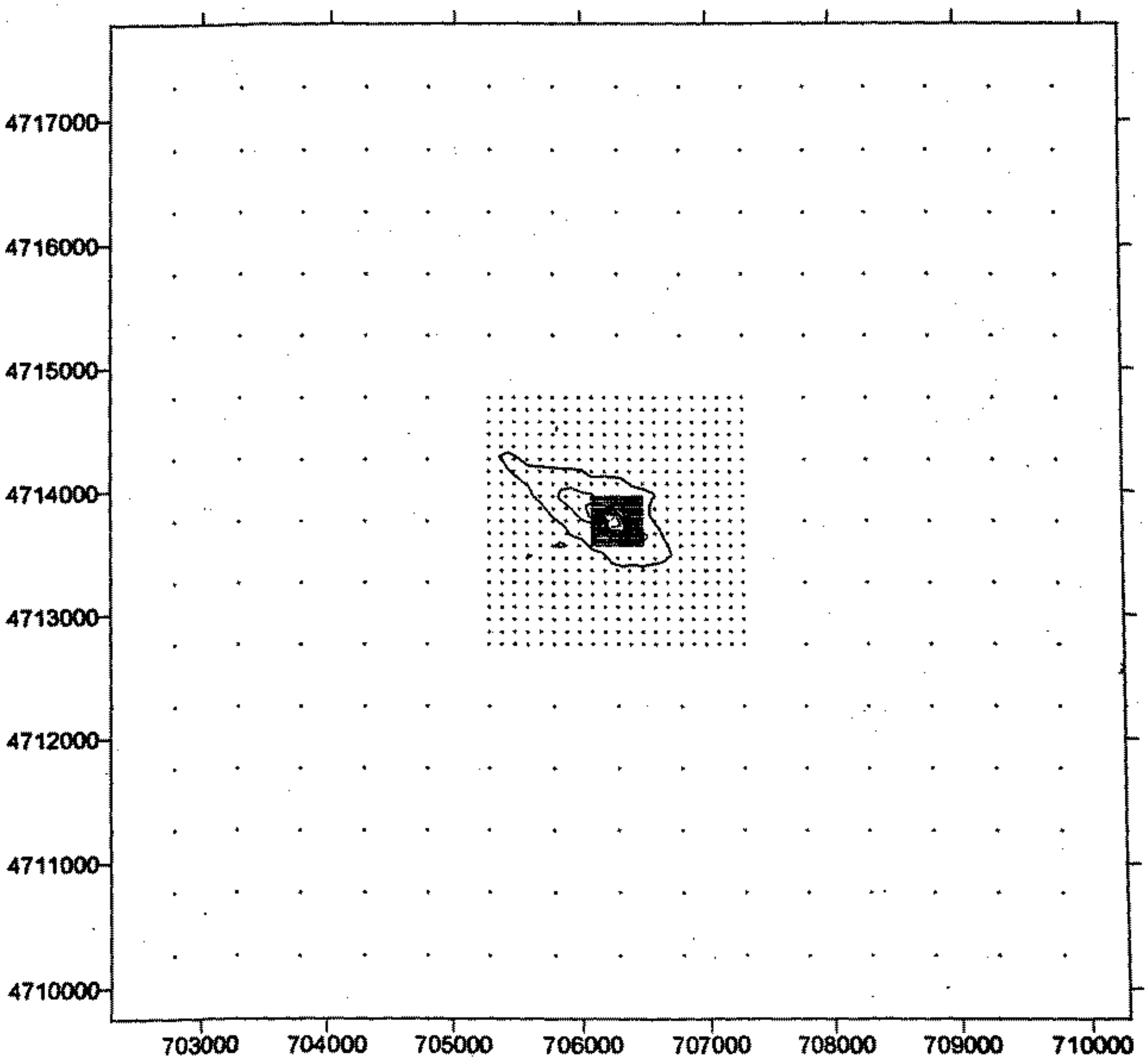


Figure 1-4
PM-10 Annual Modeling Results for Meteorological Year 1990

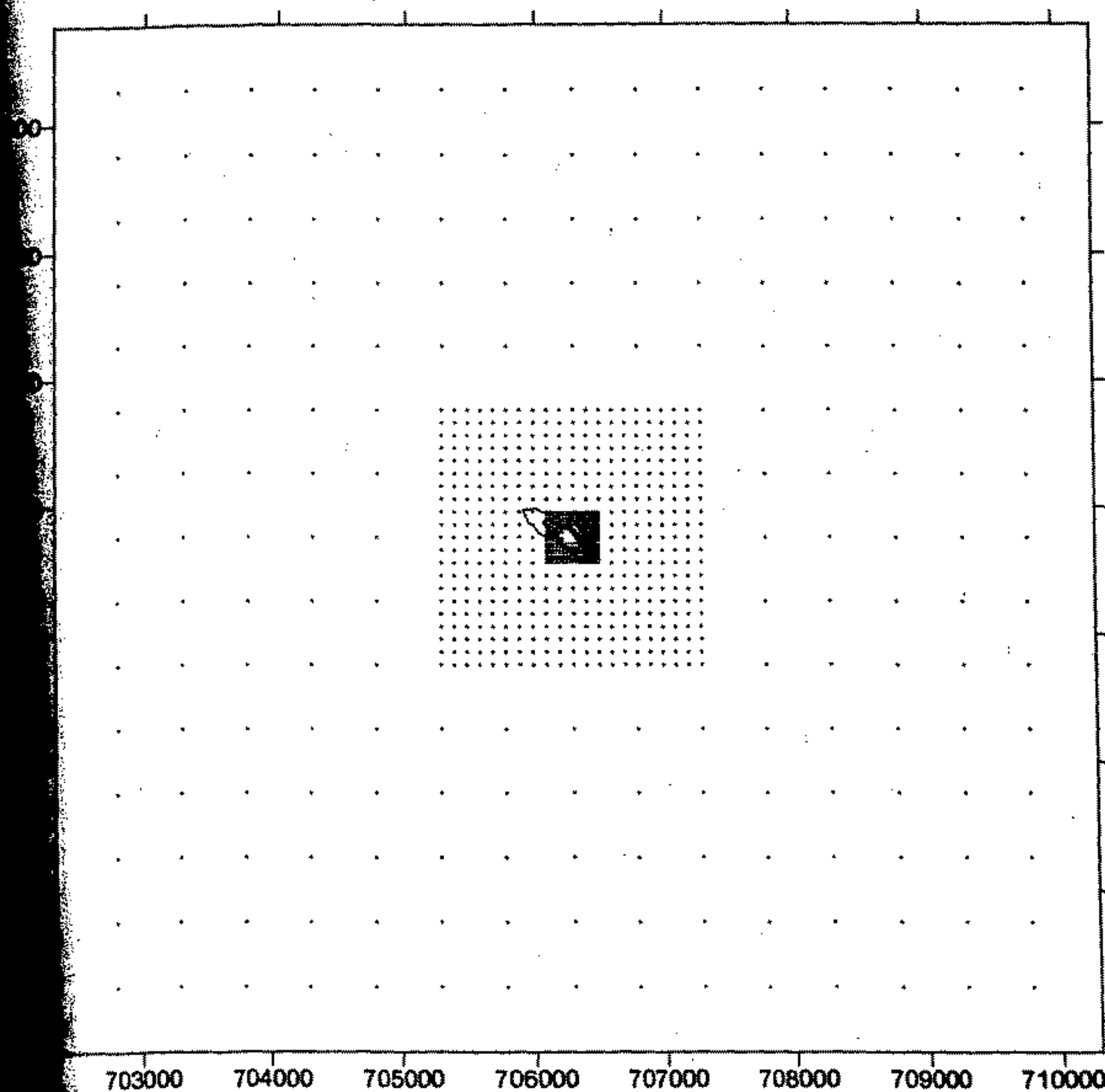


Figure 1-5
Aluminum 24-Hour Modeling Results for Meteorological Year 1991

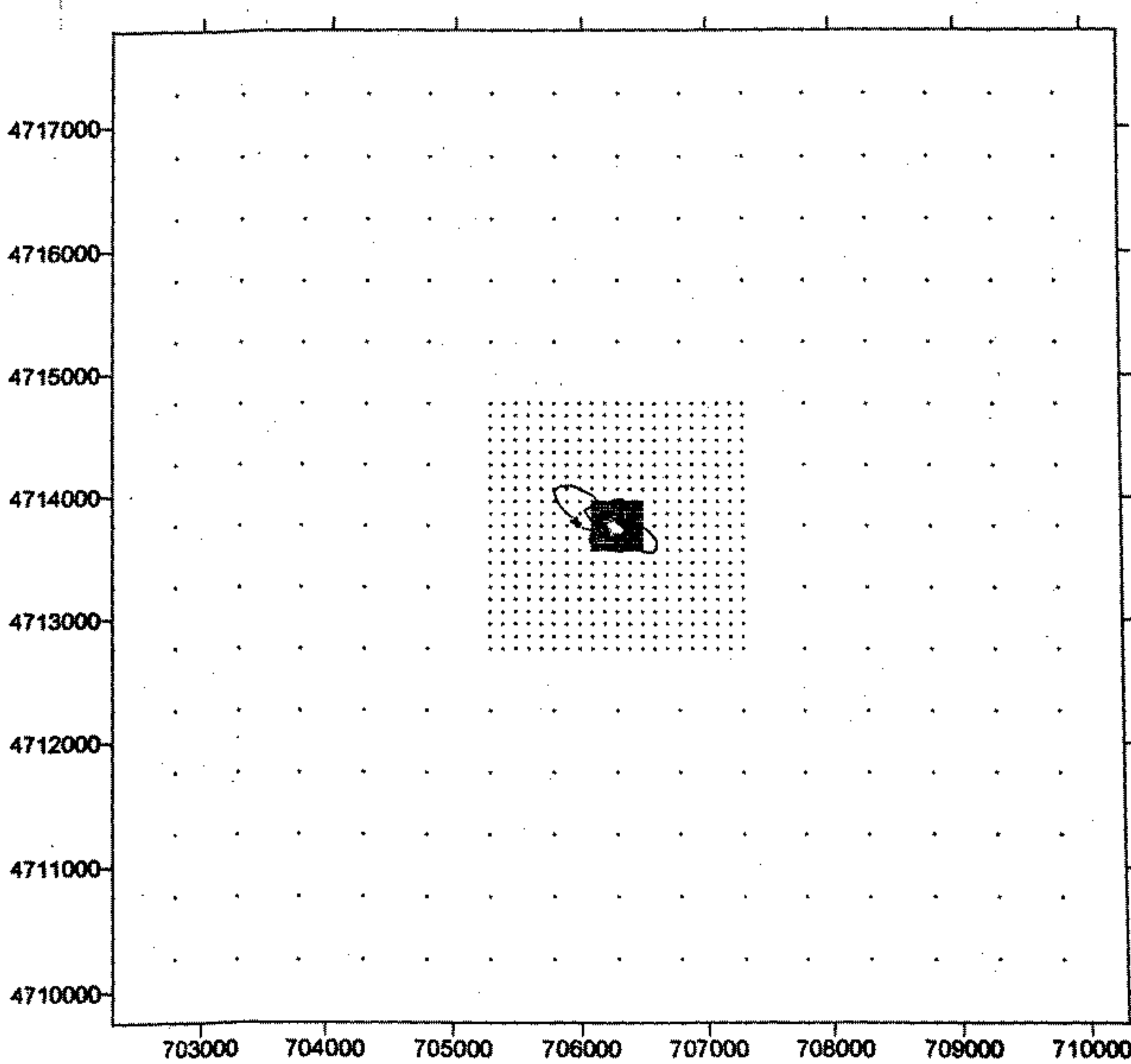


Figure 1-6
Calcium Carbonate 24-Hour-Modeling Results for Meteorological Year 1991

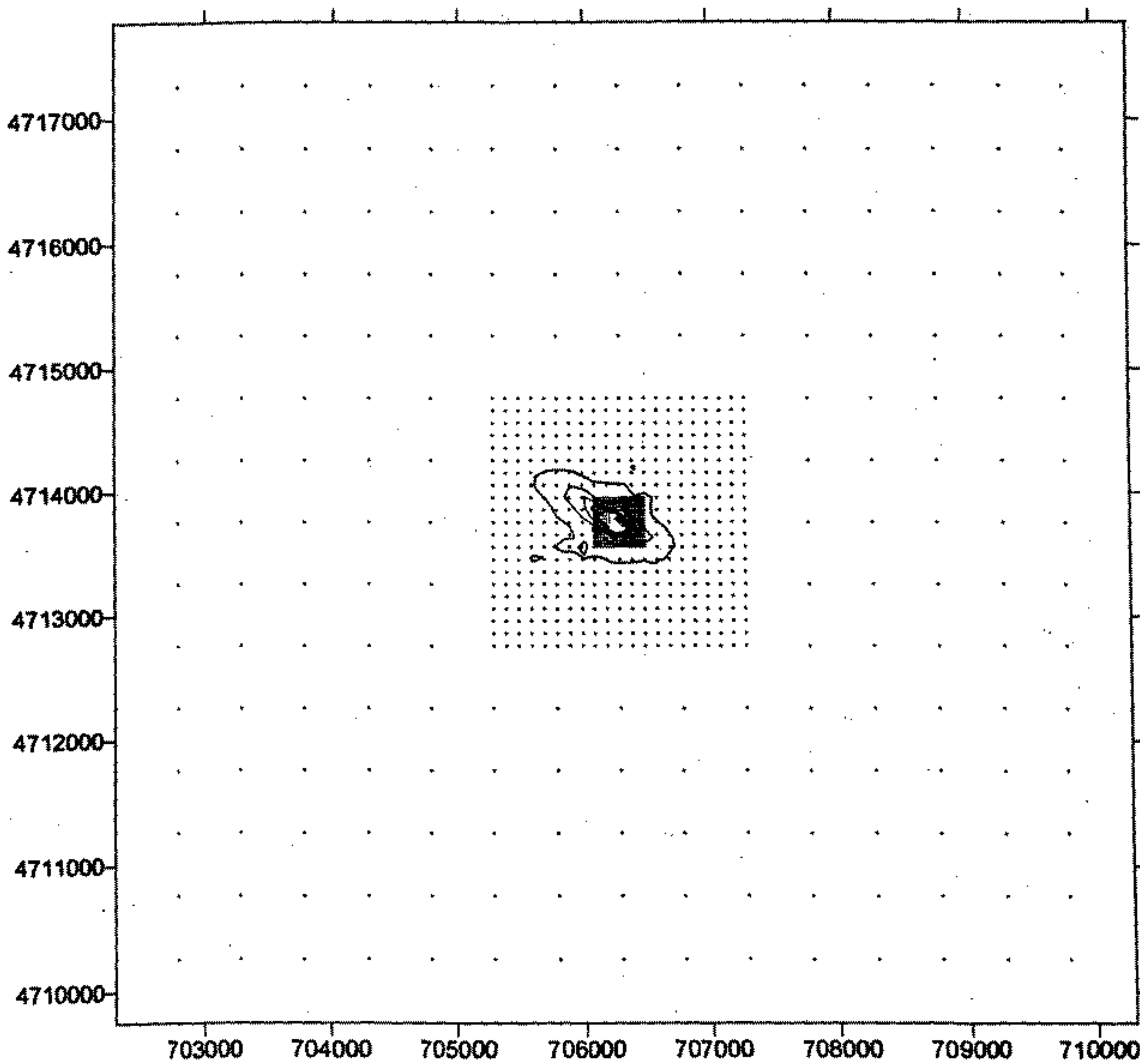
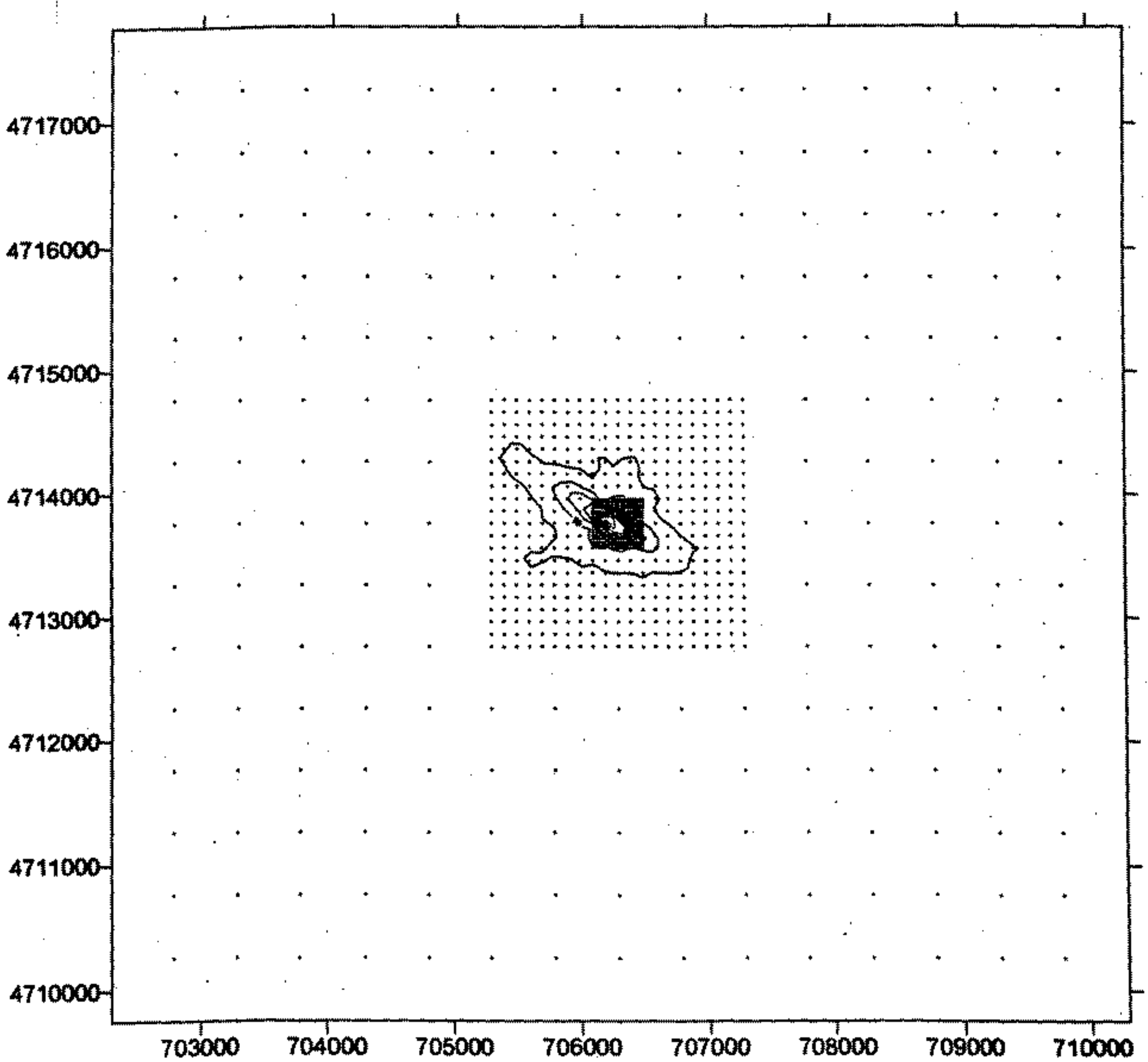


Figure 1-7
Potassium Hydroxide 24-Hour Modeling Results for Meteorological Year 1991



Charmac TRAILERS

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Department of Environmental Quality
State Air Program

T2-020412

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Copy: - Bill Rogers
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Orig → Src File

Mr. Bill Rogers
Air Quality Program Coordinator
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706-1255

RE: Historical Potential to Emit Estimates of Hazardous Air Pollutants (HAP) and Volatile Organic Compounds (VOC) for Charmac Trailers Tier II Air Quality Permit Application

Dear Mr. Rogers:

This letter is in response to the II Operating Permit/Permit to Construct Application incompleteness letter (dated March 7, 2003) sent by the Idaho Department of Environmental Quality (IDEQ) and received by Charmac on March 10, 2003. I am providing information you requested on Hazardous Air Pollutant (HAP) and Volatile Organic Compounds (VOC) Potential to Emit (PTE) estimates to complete a Tier II Air Quality Permit for Charmac Trailers (Charmac). Tetra Tech EMI was contracted by Charmac to prepare and submit the permit application. Mr. Doug Herlocker from Tetra Tech EMI (TTEMI) attended a meeting with Mr. Tom Anderson (IDEQ) and Mr. Darrin Mehr (IDEQ) on January 21, 2003 to discuss determination of PTE estimates for Charmac's paint booth operations prior to obtaining an air quality permit. It was agreed that once a PTE estimate has been approved and documented, the process of writing a Tier II Air Quality Permit could begin for Charmac.

We were informed by TTEMI that according to Environmental Protection Agency (EPA) guidance, non-permitted sources of air pollutants must base PTE estimates on a continuous 24-hour, 365-day operation. This is equivalent to 8,760 hours of annual operations. Our facility, however, has limitations on its manufacturing process that prevent us from operating our paint booth spray guns continuously for 8,760 hours. During discussions with Mr. Herlocker, it was agreed that Charmac cannot operate at this capacity and that an effort to determine realistic PTE estimates for Charmac is dependent on the limitations of our paint coating process. The paint coating operations at Charmac use two paint booths (Paint Booth #1 and Paint Booth #2- descriptions contained in Tier II Permit Application). Paint booth #1 was the original booth when property was purchased and has been in operation since 1979. Paint Booth #2 was installed in 1986. Both booths are used to coat trailer frames and exhaust to the ambient air. A determination must be made for PTE emissions from our paint booths based on the capacity of our process. We are therefore using a continuous 8,760-hour annual operation schedule to determine PTE, but the painting process limitation is incorporated into this estimate. The following sections describe the paint coating capacity, as well as the process used to determine PTE estimates for Charmac.

ACTUAL PRODUCTION RATES

Charmac manufactures three main types of trailers: horse trailers (steel frame), aluminum trailers (aluminum frame), and cargo trailers (steel frame), as described below including percentage of total production and actual production records for 2001.

__Charmac 2001 Actual Production Record Documentation:__

- Horse trailers produced: 288 (23%)
- Aluminum trailers produced: 85 (5%)
- Cargo trailers produced: 906 (72%)

Total=1259 (100%)

ANNUAL TRAILER PRODUCTION RATES FOR HAP AND VOC PTE ESTIMATES

The horse trailers are painted in Paint Booth #2 and are almost exclusively coated with white primer and white topcoat paint mixtures. Paint booth #1 is primarily used to paint cargo trailers averaging18-foot (ft) in length and they are almost exclusively coated with black primer and black topcoat paint mixtures. Accordingly, the horse trailer and cargo trailer painting capacity will be used to determine PTE estimates for Charmac. It has been determined that if we were to solely paint horse and cargo trailers non-stop for 8,760 hours in a one year period, this would represent the maximum PM_{10}, Hazardous Air Pollutants (HAP), and Volatile Organic Compounds (VOC) emissions from both paint booths. The following description details the time required to paint one horse and one cargo trailer, and the paint capacity of operations for a continuous 24-hour (hr) and annual period. In addition, required paint booth maintenance has been included in this PTE estimation.

__Time required to coat one (1) cargo trailer in Paint Booth #1:__

- Required preparation time = Approximately ½ hr
- Required painting time = Approximately 1 ½ hrs (½ hr for primer paint application, ½ hr to dry and ½ hr for topcoat paint application)
- Required baking time = ½ hr
- Final inspection and removal = ½ hr
- **Total time required to paint 1 cargo trailer = 3 hours**

__Time required to coat one (1) horse trailer in Paint Booth #2:__

- Required preparation time = Approximately 1 hr
- Required painting time = Approximately 2.5 hrs (1 hr for primer paint application, ½ hr to dry and 1 hr for topcoat paint application)
- Required baking time = 1 hr
- Final inspection and removal = ½ hr
- **Total time required to paint 1 horse trailer = 5 hours**

__Time required for paint booth maintenance:__

- One hour required for paint spray system cleaning, maintenance, and air duct cleaning and filter changes per every 8-hrs of operation for each paint booth
- **Total time required for paint booth maintenance = 3 hours per booth per 24-hour period**

24-hour capacity of Paint Booth #1:

- 1 cargo trailer per 3-hr period
- **Capacity of Paint booth #1 in 24-hour period: (24hr-3hr)/3 = 7.0 cargo trailers per 24-hour period per Paint Booth #1**

24-hour capacity of Paint Booth #2:

- 1 horse trailer per 5-hr period
- **Capacity of Paint booth #2 in 24-hour period: (24hr-3hr)/5 = 4.2 horse trailers per 24-hour period per Paint Booth #2**

Annual capacity of Paint Booth #1:

- **Total annual capacity of Paint Booth #1: 7.0 x 365 (days) = 2,555 cargo trailers per year**

Annual capacity of Paint Booth #2:

- **Total annual capacity of Paint Booth #2: 4.2 x 365 (days) = 1,533 horse trailers per year**

ANNUAL PAINT USAGE DOCUMENTATION FOR HAP AND VOC PTE ESTIMATES

Annual estimate of paint usage for Paint Booth #1 based on 8,760 hours of operation:

- Approximately ½ gallon of black primer mixture used per cargo trailer
- Approximately ½ gallon of black topcoat mixture used per cargo trailer
- Total black primer mixture per year: ½ x 2,555 (cargo trailers) = 1,278 gal/yr
- Total black topcoat mixture per year: ½ x 2,555 = 1,278 gal/yr
- **Total black topcoat and primer used per year: 1,278 + 1,278 = 2,555 gal/yr**

Annual estimate of paint usage for Paint Booth #2 based on 8,760 hours of operation:

- Approximately 2 gallons of white primer mixture used per horse trailer
- Approximately 3 gallons of white topcoat mixture used per horse trailer
- Total white primer mixture per year: 2 x 1,533 (trailers) = 3,066gal/yr
- Total white topcoat mixture per year: 3 x 1,533= 4,599 gal/yr
- **Total white topcoat and primer used per year: 3,066+ 4,599 = 7,665 gal/yr**

ANNUAL SOLVENT USAGE FOR HAP AND VOC PTE ESTIMATES

Solvent solution is used to clean the paint spray systems on a daily basis. Our paint intake lines and spray guns require this to ensure consistent paint flow and transfer efficiency of the paint to the trailer frame. Once per day, a solvent solution is pulled through the intake lines and spray guns to clean out the entire system. The solvent is sprayed through the system into a collection system. The used solvent is then cycled through our solvent waste recycling system and is reused. Approximately one (1) quart of solvent is used per day, per paint booth to flush each paint spray system. In total, ½ (or 0.5) gallons (gal) of solvent is used per day.

The Tier II Permit Application (Emissions Inventory) provides chemical inventory information on the solvent we currently use (PPG, Inc. product # MS100). During the meeting between Mr. Herlocker, Mr. Anderson and Mr. Mehr, They discussed the process we use to recycle the solvent that is used to flush out our paint systems. Mr. Herlocker provided all necessary information on the Recycl-It Solvent Waste Recycle Distillation System (manufactured by Lenan Corporation) in technical information that was sent via U.S. Mail to Mr. Anderson. Technical information from the manufacturer rates the solvent recovery efficiency at 95 percent.

For this estimation, it is assumed that 5 percent of the solution is lost during the process of flushing the paint spray system and spraying the solvent into a collection system. It can also be assumed that another 5 percent is lost in the Recycl-It Solvent Waste Recycle System. In total, 10 percent of the solvent is emitted to the ambient air. HAP and VOC emission from solvent emissions are calculated using provided below

Annual estimate of solvent usage:

- Approximately one quart (0.25 gal) of solvent (product # MS100- 6.66 lb/gal) per booth per day
- Total solvent used per day = 0.5 gal
- Total solvent used annually= 0.5 gal X 365 = 182.5 gal
- Percentage of solvent lost during flush cleaning = 5%
- Solvent waste recovery efficiency = 95%
- Total solvent emissions per day = 10% X 0.5 (gal) = 0.05 gal/day
- **Total annual solvent emissions = 0.05 gal/day X 365 days = 18.25 gal**

Paint Mixture Components:

- White primer components based on average usage of 2.0 gal/horse trailer (with weight/gal and volume amount of mixture):

o 57.1 % white primer paint (product # DP48-11.9 lb/gal):	1.14 gal
o 28.6% catalyst (product # MRDP401LF-7.32 lb/gal) :	0.57 gal
o 14.3% reducer (product # MR187-6.93 lb/gal) :	0.29 gal
100%	**2.00 gal**

- White topcoat components based on average usage of 3.0 gal/horse trailer (with weight/gal and volume amount of mixture):

o 65.6 % white topcoat paint (product # M30-10.5 lb/gal):	1.97gal
o 16.4% reducer (product # MR187-6.9 lb/gal):	0.49 gal
o 16.4% hardener (product # MFA360-8.8 lb/gal):	0.49 gal
o 1.6% Accelerator (product # MX200-8.2 lb/gal):	0.05 gal
100%	**3.00 gal**

Cargo Trailer Paint Mixture:

- Black primer components based on average usage of 0.5 gal/horse trailer (with weight/gal and volume amount of mixture):

- 57.1 % black primer paint (product # DP90-11.04 lb/gal): 0.29 gal
- 28.6% catalyst (product # MRDP401LF-7.32 lb/gal) : 0.14 gal
- 14.3% reducer (product # MR187-6.93 lb/gal) : 0.07 gal

100% **0.50 gal**

- Black topcoat components based on average usage of 0.40 gal/cargo trailer (with weight/gal and volume amount of mixture):

  - 80.1 % black topcoat paint (product # ALK300-10.5 lb/gal): 0.32 gal
  - 19.9% reducer (product # MR187-6.9 lb/gal): 0.08 gal

  100% **0.40 gal**

ANNUAL HAP AND VOC PTE EMISSIONS

Hazardous Air Pollutants (HAP) and Volatile Organic Carbons (VOC) PTE emissions are calculated based on paint usage information and chemical information contained in the original Charmac permit application emission inventory (Table 4-1, 4-2, Section 4.2) obtained from Material Safety Data Sheets (MSDS) for each individual paint product used in the manufacturing process. For this PTE determination, it has been assumed that 100 percent of all HAP and VOC emissions are released into the ambient air. In addition to HAP and VOC emissions from painting, emissions from solvent usage are also documented. A summary of Paint mixtures, annual PTE estimates for HAP and VOC emissions is presented below.HAP and VOC Components:

Horse Trailer and cargo trailer HAP and VOC emissions were calculated using amount of paint (topcoat and primer) used per trailer and MSDS sheets. Information for HAP and VOC emissions from horse trailer painting is provided in Table 1. Information for HAP and VOC emissions from cargo trailer painting is provided in Table 2. Information for HAP and VOC emissions from solvent usage is provided in Table 3. Table 4 provides a summary of all HAP and VOC emissions.

TABLE 1
PTE HAP AND VOC EMISSIONS FROM HORSE TRAILER PAINTING

HAP (CAS #)/Total VOC Emissions	Emissions Rate (lb/trailer)	Emissions Rate (ton/yr)
Total VOC	**29.3**	**22.5**
Ethyl Benzene (100414)	1.1	0.8
Methyl Ethyl Ketone (78933)	2.7	2.1
Methyl Isobutyl Ketone (108101)	2.4	1.8
Naphthalene (91203)	1.4	1.1
Toluene (108883)	2.4	1.8
Styrene (100425)	0.2	0.2
Xylenes (1330207)	2.2	4.8
Total HAP	**16.4**	**12.6**

Notes (continued):

1. Annual emission rates based on estimation of 1,533 horse trailers painted annually.

HAP Hazardous Air Pollutant
VOC Volatile Organic Compound
CAS Chemical Abstract Service
lb pound
lb/hr pound per hour
ton/yr tons/year

TABLE 2
PTE HAP AND VOC EMISSIONS FROM CARGO TRAILER PAINTING

HAP (CAS #)/Total VOC Emissions	Emissions Rate (lb/trailer)	Emissions Rate (ton/yr)
Total VOC	**5.80**	**7.40**
Ethyl Benzene (100414)	0.01	0.01
Methyl Ethyl Ketone (78933)	0.30	0.38
Methyl Isobutyl Ketone (108101)	0.60	0.77
Naphthalene (91203)	0.20	0.26
Toluene (108883)	0.40	0.51
Styrene (100425)	0.04	0.05
Xylenes (1330207)	0.50	0.64
Total HAP	**2.05**	**2.62**

Notes:

1. Annual emission rates based on estimation of 2,555 cargo trailers painted annually.

HAP Hazardous Air Pollutant
VOC Volatile Organic Compound
CAS Chemical Abstract Service
lb pound
ton/yr tons/year

TABLE 3
PTE HAP AND VOC EMISSION FROM SOLVENT

HAP (CAS #)/Total VOC Emissions	Emissions Rate (ton/yr)
Total VOC	**0.06**
Ethyl Benzene (100414)	0.0
Methyl Ethyl Ketone (78933)	0.0
Methyl Isobutyl Ketone (108101)	0.0
Naphthalene (91203)	0.0
Toluene (108883)	0.03
Styrene (100425)	0.0
Xylenes (1330207)	0.0
Total HAP	**0.03**

Notes:

1. Annual emission rates based on use of 18.25 gallons per year of solvent solution (product MS100).

HAP Hazardous Air Pollutant
VOC Volatile Organic Compound
CAS Chemical Abstract Service
ton/yr tons/year

TABLE 4
SUMMARY OF COMBINED PTE HAP AND VOC EMISSION

HAP (CAS #)/Total VOC Emissions	Emissions Rate (ton/yr)
Total VOC	**35.16**
Ethyl Benzene (100414)	0.81
Methyl Ethyl Ketone (78933)	2.48
Methyl Isobutyl Ketone (108101)	2.57
Naphthalene (91203)	1.36
Toluene (108883)	2.31
Styrene (100425)	0.25
Xylenes (1330207)	5.44
Total HAP	**15.25**

Notes:

1. Annual emission rates based on combination of hourly rates for horse trailers and cargo trailers (from Table 1and Table 2).

HAP Hazardous Air Pollutant
CAS Chemical Abstract Service
VOC Volatile Organic Compound
lb pound
lb/hr pound per hour

The above PTE estimates are presented in conjunction with the Charmac Tier II Air Quality Permit Application. According to the calculations presented in this document and previous documents, Charmac is in fact a minor source of PM10, HAP, and VOC emissions and therefore we should meet the requirements for a Tier II air quality permit, which will bring us into compliance with IDEQ air quality regulations.

All information in this letter is based on our knowledge of our manufacturing process and is offered to assist the Idaho Department of Environmental Quality in issuing an air quality permit for our facility. Charmac is requesting a hard copy draft of the permit prior to being issued for public comment. If you have any questions, please feel free to contact me at (208) 733-5241 or our environmental consultant, Doug Herlocker at (208) 343-4085.

Sincerely,

Lloyd Casperson
President, Charmac Trailers

Cc: Doug Herlocker, Tetra Tech EMI

Charmac
TRAILERS
Phone 800-544-7904 or 208-733-5241 Fax 208-733-5557 P.O. Box 205 Twin Falls, Idaho 83303
Web Site: www.charmactrailers.com Email: charmac@charmactrailers.com

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DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A.Q PROGRAM

August 4, 2003

Mr. Bill Rogers
Air Quality Program Coordinator
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706-1255

RE: Charmac Draft Tier II Operating Permit and Permit to Construct
(Permit Number T2-020412)

Dear Mr. Rogers:

This letter is in response to the Draft Tier II Operating Permit/Permit to Construct (Permit Number T2-020412) (Tier II Permit) that was sent by the Idaho Department of Environmental Quality (IDEQ) on July 1, 2003 and received by Charmac Trailers (Charmac) on July 2, 2003. Mr. Doug Herlocker from Tetra Tech EMI (TTEMI) also received a copy of the draft permit.

Mr. Harbi Elshefari and yourself spoke with Mr. Herlocker on several occasions regarding the limits established in the draft permit. Mr. Herlocker has provided us with the information to respond and request modification to the draft permit that will allow for flexibility in our operations, and still allow us to meet the permit requirements and meet the rules established by the National Ambient Air Quality Standards (NAAQS).

REQUEST FOR MODIFICATION OF PM_{10} DAILY AND ANNUAL EMISSION LIMITS BASED ON CURRENT MODELING INFORMATION

TTEMI prepared the Tier II Air Quality Permit application for Charmac, which was originally submitted on September 12, 2002. Additional information was provided on several occasions, and IDEQ determined the application to be complete on May 14, 2003.

Modeling information was provided in the permit application that demonstrated worst-case scenario meteorological conditions combined with PM_{10} emissions from the Charmac facility. The PM_{10} emission rates were used in the Industrial Source Complex Plume Rise Model Enhancements model (ISC-PRIME) to estimate air quality impacts. Modeled emission rates were provided in the Revised Air Quality Impact Analysis For Charmac Trailers Tier II Operating Permit (permit completeness determination # T2-020412) for The Idaho Department of Environmental (dated February 18, 2003).

12307

SOAQP

The modeled daily and annual PM_{10} emission rates from paint booth vents A, B, and C, respectively, are described by the equations below.

Daily and Annual PM_{10} Emission Rates for ISC-PRIME Modeling:

- 0.0391 gram/second (g/sec) [Vent A] + 0.0391g/sec [Vent B] + 0.0781 g/sec [Vent C] = **0.1563 g/sec**
- 0.1563 g/sec x 1 pound (lb)/453.59 gram (g) x 3600 sec/hour (hr) = **1.24 lb/hr**
- 1.24 lb/hr x 24 hr/day = **29.76 lb/day**
- 29.76 ld/day x 365 days/ year (yr) = 10,862 lbs/yr x 1 ton/2,000lb = **5.43 ton/yr**

The above emission rates were included in the latest revised permit submission that included paint usage based a worse case scenario using exclusively white primer paint. White primer contains the highest percentage of solids, so Charmac's potential to emit PM_{10} is maximized when white primer is being used in the paint guns and provides the basis for the following equations that provided the necessary information for the ISC-PRIME modeling.

Paint and Spray Gun Information Used for ISC-PRIME modeling Equations:

63.85% solids x 11.9 lb/gallon (gal) = 7.6 lb solid/gal

7.6 lb solid/gal x 6.81gal/hr x 2 (spray guns) x 0.30 (overspray) x 0.04 (solids) = 1.24 lb solid/hr

Based on the above equations, Charmac is requesting PM_{10} emission limits described in Appendix A of the Tier II Permit be modified to be consistent with the emissions used for ISC-PRIME modeling which demonstrate compliance with the NAAQS using a worse case scenario for PM_{10} emissions. The proposed emission limits are summarized below.

Proposed daily and annual PM_{10} emission limits for Charmac:

- Total Daily PM_{10} Emission Limit = 29.76lb/day
- Total Annual PM_{10} Emission Limit = 5.43 ton/yr

$\frac{29.76 \text{ lb}}{\text{day}} \cdot \frac{1 \text{ Ton}}{2{,}000 \text{ lbs}} \cdot \frac{365 \text{ days}}{1 \text{ yr}} = 5.43$

REQUEST FOR MODIFICATION OF VOC DAILY AND ANNUAL EMISSION AND USAGE LIMITS BASED ON PREVIOUS PTE INFORMATION PROVIDED TO IDEQ

Charmac sent (via U.S. Mail) a letter (RE: Historical Potential to Emit [PTE] Estimates of Hazardous Air Pollutants and Volatile Organic Compounds for Charmac Trailers Tier II Air Quality Permit Application [Historical PTE Estimate Letter]) to the IDEQ on February 10, 2003, providing information on potential to emit (PTE) estimates for Hazardous Air Pollutants (HAP) and Volatile Organic Compounds (VOC) emissions that result from operations at Charmac. The information provided in this document provided a detailed analysis on HAP and VOC emissions from a maximum production rate based on a continuous 24-hour, 365-day operation.

The amount of VOC and HAP emissions presented in the PTE estimates was used to establish enforceable limits for annual paint usage in paint booth #1 and paint booth #2.

The PTE estimate was presented using a combination of black and white topcoat and primer to paint horse trailers and cargo trailers at our facility. HAP and VOC information was based on Material Safety Data Sheets (MSDS) for each individual component of the paint mixture. The amounts were then analyzed to determine the amount of VOC and HAP that would be emitted on a per-trailer and annual basis. The total amount of paint used per year in this scenario is summarized below.

<u>Annual paint usage documentation for HAP and VOC PTE estimates:</u>

- Total black primer mixture used per year: 0.4 gal x 2,555 (cargo trailers) = 1,022 gal/yr
- Total black topcoat mixture used per year: 0.5 x 2,555 = 1,278 gal/yr
- **Total black topcoat and primer used per year: 1,022 + 1,278 = 2,300 gal/yr**
- Total white primer mixture used per year: 2 x 1,533 (trailers) = 3,066gal/yr
- Total white topcoat mixture used per year: 3 x 1,533= 4,599 gal/yr
- **Total white topcoat and primer used per year: 3,066+ 4,599 = 7,665 gal/yr**
- **Total paint usage per year = 9,965 gal/yr**

The Tier II Permit (Section 3.4) limits the amount of primer and topcoat mixtures sprayed in paint booth # 1 to 6.3 gallons per day and 2,300 gallons per year. The Tier II Permit (Section 4.4) limits the amount of primer and topcoat mixtures sprayed in paint booth # 2 to 21 gallons per day and 7,665 gallons per year.

Charmac is requesting the Tier II Permit limitation be modified to restrict total amount of paint allowed per day and per year, instead of a limitation based on usage per booth, per day and per year. Charmac is in agreement with the limitation on total paint usage, but would like flexibility to use paint booth #1 or paint booth #2, based on manufacturing demands, and other factors, including paint booth maintenance and repair.

The modified usage limit would be a combined limitation of paint booth #1 and paint booth #2 to a single limitation of 27.3 gallons per day and 9,965 gallons per year for both paint booths.

During your conversation with Mr. Herlocker, it was requested that Charmac propose a scenario using 9,965 gallons of black paint mixture (topcoat and primer) exclusively or 9,965 gallons of white paint mixture (topcoat and primer). For IDEQ to approve this modification, this scenario must demonstrate that VOC emissions will not exceed the standard of 100 ton/yr and the HAP emissions will not exceed an aggregate of 25 ton/yr or 10 ton/yr for an individual HAP for Charmac to remain a permitted Tier II facility. Two scenarios will be presented; one scenario using exclusively black primer and black topcoat and a second scenario using exclusively white primer and white topcoat. The scenario that produces the highest amount of VOC and HAP emissions will be proposed for enforceable daily and annual VOC emission limits for Charmac's Tier II Permit.

<u>**Exclusive White Primer and Topcoat Paint Mixture Use**</u>

Calculated daily and annual HAP and VOC emission rates for exclusive use of white topcoat and white primer mixture is presented in Table 1.

TABLE 1
DAILY AND ANNUAL HAP AND VOC EMISSIONS FROM EXCLUSIVE HORSE TRAILER PAINTING USING WHITE TOPCOAT AND PRIMER PAINT MIXTURES

HAP (CAS #)/Total VOC Emissions	Emissions Rate (lb/trailer)	Emissions Rate (lb/day)	Emissions Rate (ton/yr)
Total VOC	**29.3**	**161.5**	**29.2**
Ethyl Benzene (100414)	1.1	6.05	1.1
Methyl Ethyl Ketone (78933)	2.7	14.9	2.7
Methyl Isobutyl Ketone (108101)	2.4	13.2	2.4
Naphthalene (91203)	1.4	7.7	1.4
Toluene (108883)	2.4	13.2	2.4
Styrene (100425)	0.2	1.1	0.2
Xylenes (1330207)	6.2	34.1	6.2
Total HAP	**16.4**	**90.2**	**16.5**

Notes:

1. Annual emissions based on using 9,965 gallons of white topcoat and primer mixture
2. Equation: 9965 gallons /5 gallons mixture per trailer = 1993 potential trailers painted
3. Proposed daily emission rate of 27.3 gallons mixture/5gallons per trailer = 5.5 horse trailers per day
4. Daily emissions = HAP/VOC per trailer x 5.5
5. Annual HAP/VOC emissions = emission rate per trailer x 1993 (horse trailers)

lb pound
yr year

Table 1 demonstrates that if the proposed limit of 9,965 gallons of white primer and topcoat mixtures were used exclusively, Charmac would not exceed the annual HAP and VOC limit threshold to remain a permitted Tier II facility.

Exclusive Black Primer and Topcoat Paint Mixture Use

Calculated daily and annual HAP and VOC emission rates for exclusive use of black topcoat and black primer mixture is presented in Table 2.

TABLE 2
DAILY AND ANNUAL HAP AND VOC EMISSIONS FROM EXCLUSIVE CARGO TRAILER PAINTING USING BLACK TOPCOAT AND PRIMER PAINT MIXTURES

HAP (CAS #)/Total VOC Emissions	Emissions Rate (lb/trailer)	Emissions Rate (lb/day)	Emissions Rate (ton/yr)
Total VOC	**5.80**	**175.8**	**32.1**
Ethyl Benzene (100414)	0.01	0.3	0.05
Methyl Ethyl Ketone (78933)	0.3	9.1	1.7
Methyl Isobutyl Ketone (108101)	0.60	18.2	3.3
Naphthalene (91203)	0.20	6.1	1.1
Toluene (108883)	0.40	12.1	2.2
Styrene (100425)	0.04	1.2	0.2
Xylenes (1330207)	0.50	15.2	2.8
Total HAP	**2.05**	**62.1**	**11.3**

Notes:

1. Annual emissions based on using 9,965 gallons of black topcoat and primer mixture
2. Equation: 9965 gallons /0.9 gallons per trailer = 11,072 potential trailers painted
3. Proposed daily emission rate of 27.3 gallons mixture/0.9 gallons per trailer = 30.3 horse trailers per day
4. Daily HAP/VOC emissions = emission rate per trailer x 30.3
5. Annual HAP/VOC emissions = emission rate per trailer x 11,072

lb pound
yr year

Table 1 and Table 2 demonstrate that if the proposed limit of 9,965 gallons of black primer/topcoat or 9,965 gallons of white primer/topcoat mixtures were used exclusively, or a combination thereof, Charmac would not exceed the annual HAP and VOC threshold limit requiring a Tier I Air Quality Permit.

Maximum VOC/HAP Emissions and Proposed Daily and Annual VOC Emission Limits

Maximum individual and total HAP emissions, as well as maximum VOC emissions from the two scenarios presented above combined with solvent and combustion heater emissions (from latest permit application) will represent maximum PTE VOC/HAP emissions as well as proposed daily and annual VOC emission limits of the Tier II Permit. A summary of maximum PTE VOC/HAP emissions, and proposed VOC/HAP emission limits is presented in Table 3.

TABLE 3
SUMMARY OF COMBINED PTE HAP/VOC EMISSIONS AND PROPOSED TIER II PERMIT EMISSION LIMITS

HAP (CAS #)/Total VOC Emissions	PTE Emission Rate/Proposed Limit (lb/day)	PTE Emission Rate/Proposed Limit (ton/year)
Total VOC	**176.6**	**32.3**
Total HAP	**90.2**	**16.5**

Notes:

1. Daily HAP/VOC emissions = maximum emission rate per day (from Table 3 and Table 4).

HAP Hazardous Air Pollutant
CAS Chemical Abstract Service
VOC Volatile Organic Compound
lb pound
yr year

Charmac is requesting the modifications described above be incorporated the Charmac Tier II Operating Permit and Permit to Construct (Permit Number T2-020412).

These estimates are presented in conjunction with the Charmac Tier II Air Quality Permit Application. According to the calculations presented in this document and previous documents, Charmac is a minor source of PM_{10}, HAP, and VOC emissions and should meet the requirements for a Tier II air quality permit.

All information in this letter is based on our knowledge of our manufacturing process and is offered to assist the Idaho Department of Environmental Quality in issuing an air quality permit for our facility. Charmac is requesting a hard copy draft of the modified permit prior to being issued for public comment. If you have any questions, please feel free to contact me at (208) 733-5241 or our environmental consultant, Doug Herlocker at (208) 343-4085.

Sincerely,

Lloyd Casperson
President, Charmac Trailers

Cc: Doug Herlocker, Tetra Tech EMI

APPENDIX B

Charmac Trailers, Twin Falls
Tier II Operating Permit and Permit to Construct
No. T2-020412

Emission Estimates Calculations
Engineering Memorandum by the Technical Services Division

Emissions Inventory Memorandum

November 17, 2003

Charmac Trailers, Twin Falls

T2-020412

Prepared by:

Darrin Mehr, Air Quality Engineer, Associate
Division of Technical Services

Acronyms, Units, and Chemical Nomenclatures

Btu	British thermal units
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
fps	feet per second
GMAW	gas metal arc welding
HAPs	hazardous air pollutants
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
In. w.g.	inches, water column, gauge
K	Kelvin
lb/hr	pounds per hour
MMBtu	million British thermal units
NO_X	nitrogen oxides
O_2	oxygen
O_3	ozone
Pb	lead
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	permit to construct
PTE	potential to emit
SO_2	sulfur dioxide
SSPO	Stationary Source Programs Office
VOC	volatile organic compound
TAPs	toxic air pollutants
T/yr	tons per year

1. PURPOSE

The purpose for this memorandum is to verify the validity of the emissions estimates from the Charmac Trailers (Charmac) Twin Falls, Idaho facility.

2. PROJECT DESCRIPTION

Charmac has applied for a Tier II operating permit for their existing facility. The Department of Environmental Quality's (DEQ) Stationary Source Programs Office (SSPO) is issuing a permit under the authority of both the permit to construct (PTC) and Tier II operating permit programs. The permit will cover the existing operations of this facility. Pre-construction TAPs compliance has been excluded from the permitting review for this project, according to the direction from the SSPO.

The permitting project examines the potential to emit (PTE) of criteria air pollutants and hazardous air pollutants (HAPs) for the entire facility. Paint spray booths are the largest sources of air emissions, but are non-typical sources with regard to quantifying potential to emit. The estimation of potential emissions was examined with guidance from the SSPO.

3. TECHNICAL ANALYSIS

3.1. Process Description

The details of this process description were taken from Charmac's submittal, received by DEQ on April 14, 2003. This version—or definition—of the facility's "process" supercedes all previous submittals from Charmac on this matter. Some of the earlier documentation is still relevant for evaluating the PTE estimates and is therefore still considered part of the combined PTC/Tier II operating permit application.

Charmac owns and operates a facility that manufactures cargo trailers, horse trailers, and aluminum trailers. Cargo and horse trailers are constructed on steel frames, and aluminum trailers are constructed on aluminum frames. There are air emissions resulting primarily from manufacturing cargo and horse trailers, which are welded and then painted in the paint booths. Aluminum trailers are welded, but generally are not painted.

There are two painting booths on-site that are the largest emitters of regulated air pollutants. Each paint booth has its own set actions and their time durations for individual steps in the painting process. Each step in the process may or may not create air emissions while being carried out--an important factor in determining PTE for each paint booth. A specific paint and primer makeup is also used for each type of trailer. A single trailer is painted within each booth at any time and each booth is equipped with one paint spray gun. The number of operational paint spray guns within a spray booth determines the amount of paint or primer that can be applied to in a paint booth on a short-term basis. Paint application capacity within a paint booth directly affects the potential and actual emissions of HAPs, volatile organic compounds (VOCs), toxic air pollutants (TAPs), particulate matter (PM), and particulate matter with an aerodynamic diameter of less than or equal to a nominal 10 micrometers (PM_{10}).

Each of these paint booths is specialized in its use. Charmac uses Paint Booth No. 1 to almost exclusively paint cargo trailers. Black topcoat paint and primer mixtures are primarily used to paint the cargo trailers. Similarly, Paint Booth No. 2 is used almost exclusively to paint horse trailers, and almost white primer and topcoat mixtures are almost always used to do so. In addition to the paint and primer mixtures applied to the trailers, the individual steps and amount of time required to complete each step are unique to the type of trailer being painted. Paint booth maintenance is also included in the PTE estimates. A summary of the assumptions presented by Charmac in their April 14, 2003, submittal is listed in Tables 1 – 3. The time intervals, material specifications, and amounts of materials required to paint one trailer are represented in this inventory, and are based on the Charmac's expertise and knowledge of their process and the worst case painting materials.

Table 1. PAINT BOOTH NO. 1- CARGO TRAILERS – TIME DURATION OF ACTIONS

Action	Time Duration (approximate)
Trailer preparation	0.5 hours
Painting time	1.5 hours total (0.5 hours application of primer, 0.5 hours drying, and 0.5 hours topcoat application)
Paint finish baking time	0.5 hours
Final inspection and removal from booth	0.5 hours
Total time to complete painting process	**3 hours**

Table 2. PAINT BOOTH NO. 2- HORSE TRAILERS – TIME DURATION OF ACTIONS

Action	Time Duration (approximate)
Trailer preparation	1 hour
Painting time	2.5 hours total (1 hour application of primer, 0.5 hours drying, and 1 hour topcoat application)
Paint finish baking time	1 hour
Final inspection and removal from booth	0.5 hours
Total time to complete painting process	**5 hours**

Table 3. PAINT BOOTH MAINTENANCE – TIME DURATION OF ACTIONS

Action	Time Duration (approximate)
Paint spray system cleaning, maintenance, air duct cleaning and fabric filter changeout per every 8 hour shift in a 24-hour operating day	1 hour per 8-hour shift
Total time to complete maintenance process	**3 hours**

The amount of time required to complete the painting process determines how many trailers of each type can be processed for both the daily and annual periods. Taking into account the 3 hours of maintenance required daily for each paint booth, Paint Booth No. 1 can potentially process 7.0 cargo trailers per day, or 2,555 cargo trailers per year, if operated 365 days per year. Similarly, Paint Booth No. 2 can potentially process 4.2 horse trailers per day, or a total of 1,533 horse trailers per year, if operated 365 days per year.

The potential daily and annual amounts of paint materials applied in each paint booth can be found in the "Usage Rate Information" sections for black and white primer and topcoat mixtures, located in the spreadsheet in Attachment A of this memorandum. This information includes the composition of each primer and topcoat, including base paint or primer, catalyst, reducer, hardener, and accelerator, present in the formulations this facility uses in its process. DEQ's verification analysis of Charmac's application materials, up to and including the information received on April 14, 2003, is contained in Attachment A of this memorandum, and Tables 1 through 9 of this memorandum.

Information relied on by DEQ to establish potential to emit from the facility and demonstrate that the facility was a natural non-major source of HAPs and VOCs, as well as other regulated air pollutants, was submitted by Charmac and received by DEQ between September 12, 2002, and April 14, 2003. Information received during this time period is represented in Tables 1 through 10, and Attachments A and D, of this memorandum.

Additional information was submitted by Charmac following their review of the facility draft version of the PTC/Tier II permit. Charmac requested alterations to the permit's allowable emissions and restrictions on painting material quantities. The alterations to the original PTE evaluation are discussed in greater detail in the Emissions Estimates section below.

3.2. Equipment Listing

Charmac owns and operates the equipment listed below:

- Paint Booth No.1 – installed and operating in 1979
  Equipped with one HVLP spray gun Model No. Jet/K NR 95
  Manufactured by Sata Dan-M Company
  Particulate control filtration system
  Glass Fiber Paint Arrestor P, Model No. TYB 26-300-22-C-4-00
  Average particulate control efficiency listed at 96.5%

- Paint Booth No.2 – installed and operating in 1986
  Equipped with one HVLP spray gun Model No. LPH 200
  Manufactured by Anest Iwata Company
  Particulate control filtration system
  Glass Fiber Paint Arrestor P, Model # TYB 26-300-22-C-4-00
  Average particulate control efficiency listed at 96.5%

- Waste Solvent Recycling Unit (serves paint spray booths 1 and 2)
  Model SR-80XP Recyclit™ - 8 gallon capacity
  Manufactured by the Lenan Corporation, Janesville, Wisconsin

- Welding – 160 to 240 worker-hours of welding are performed per week. The facility uses the gas metal arc welding (GMAW) method. There are six welding stations on-site.

- Natural Gas-fired Space Heaters – Installation dates for the equipment were not specified. Heat input capacity information is listed below in Table 4.

Table 4. NATURAL GAS-FIRED SPACE HEATERS

Individual Unit Rated Heat Input Capacity (Btu/hr)	Number of Units	Total Heat Input Capacity (Btu/hr)
300,000	2	600,000
125,000	1	125,000
80,000	13	1,040,000
75,000	10	750,000
90,000	2	180,000
100,000	4	400,000
Total Units and Heat Input	**32**	**3,095,000**

3.3. Emissions Estimates

This memorandum examines the PTE of all sources that currently exist on-site. The inventory review includes paint spray booths, which are "non-typical" emissions sources for the determination of the potential to emit of regulated air pollutants. Finalizing PTE values for paint spray booths is not as straightforward as for other emissions sources such as boilers and diesel-fired engines.

Charmac's process includes the fabrication of cargo, horse, and aluminum trailers, although fabrication of aluminum trailers produces very small amounts of regulated emissions, primarily due to welding. A slightly different process is used to manufacture each type of trailer, and the potential production rates, process materials, and emissions differ for each type of trailer. For this reason, DEQ requested that Charmac determine the worst case production scenario for emissions of regulated air pollutants (criteria and HAPs). Charmac submitted three inventories on different dates for the Tier II permit application. The most recent submittal, received by DEQ on April 14, 2003, reflects Charmac's inventory, and the methodology in this submittal was applied to the emissions inventory to establish whether the existing facility was a major or non-major Title V source of regulated air pollutants. Actual process limitations for the spray paint booths and maximized daily and annual trailer throughputs were included by Charmac. The VOCs and individual HAP compositions of the painting process materials were taken from the original September 11, 2002, submittal's material safety data sheets (MSDS), and the formulations applied in the paint booths were obtained from the April 14, 2003 submittal. All VOCs and HAPs present in the paint materials were assumed to be emitted from the paint booths' vents.

The paint booths are the process bottleneck for this facility. The process description discussed above (submitted April 14, 2003) provides the steps, the time duration for each of the steps, and the materials applied, during painting of cargo and horse trailers. Welding operations were considered to occur independently of the painting process. The facility's process description does not include welding operations beyond what is used for cargo, horse, and aluminum trailer manufacturing. At this level, the emissions from welding are very small, at 0.006 lb/hr and 0.001 T/yr of PM_{10}.

PM and PM_{10} emissions from Paint Booths No.1 and No.2 are controlled by fabric filters. The fabric filters are not considered part of process design and must be included in the permit to reduce PTE to the quantities used in the ambient modeling compliance demonstration. Uncontrolled PM/PM_{10} PTE would be below the 100 T/yr major source threshold if the inherent process limitation on operation of the spray guns (i.e., the time durations of the steps required to paint one trailer) were taken into account.

An important assumption used to estimate controlled and uncontrolled PM and PM_{10} emissions from the paint booths involves the amount of overspray created during paint spraying of trailers. Charmac assumed a transfer efficiency of 70%, which equates to an overspray amount of 30%. Overspray is the amount of paint or primer not transferred to the workpiece that may be emitted to the atmosphere. The source of the overspray information was included in Charmac's submittal dated February 6, 2003, and was obtained from California's South Coast Air Quality Management District's website for paint spray booth emissions estimates. All PM was considered PM_{10}, which is a conservative assumption. Charmac's PM and PM_{10} emissions estimates applied another conservative assumption—the solids content available to be emitted as particulate matter was based on the data for the worst case material, which was white primer.

This facility once operated several wood-fired stoves for space heating. These woodstoves have been removed and replaced with natural gas-fired space heaters. This permitting analysis only accounts for natural gas-fired equipment.

Estimated emissions from welding operations and space heaters are in the "Combustion and Welding Section" of the spreadsheet in Attachment D. Emissions from these sources are not of great significance in comparison to emissions from the paint spray booths. Welding emissions were based on actual 2001 welding rod usage for the GMAW method and the PM_{10} and HAPs emission factors in AP-42 Section 12.19[a]. DEQ estimated the HAPs emissions from welding, which are primarily metals.

Potential emissions of criteria pollutants are represented for each painting booth in Tables 5 and 7. Estimated emissions of HAPs are given in Tables 6 and 8. A facility-wide summary of potential emissions is also given in Table 9. Stack parameters are listed in Table 10. Please refer to the spreadsheet section titled "Paint Spray Booths No. 1 and No. 2 and Solvent Usage Section" (see Attachment A) to review HAPs and criteria air

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[a] *Compilation of Air Pollutant Emission Factors (AP-42), Fifth Edition, Volume 1: Stationary, Point, and Area Sources*, Section 12.19, U.S. Environmental Protection Agency, Washington, D.C., January 1995.

pollutant emissions estimates for these sources. The information in these tables is intended for use in establishing the facility's non-major status for the state of Idaho's Tier I permitting program.

Paint Booth No. 1 is primarily used to paint cargo trailers. The information in Tables 5 through 9 is based on Charmac's process description and original requested emissions limits, submitted April 14, 2003, and earlier. DEQ's emission estimates are listed as the first entry in the tables, and Charmac's emission estimate values are listed in parentheses throughout this document. All PM/PM_{10} emissions estimates listed in Tables 5, 7, 9 are based on the fabric filter control for the paint booth vents.

Table 5. POTENTIAL CRITERIA AIR POLLUTANT EMISSIONS – PAINT BOOTH NO. 1

Pollutant	PM/PM_{10}	O_3[a]/VOC
Potential Emission Rate (lb/hr)	0.62 (0.62)	Not applicable
Potential Emission Rate (lb/day)	4.34	35.74 (40.6)
Potential Emission Rate (T/yr)	0.79	6.52 (7.40)

a. ozone

Table 6. HAZARDOUS AIR POLLUTANT EMISSIONS – PAINT BOOTH NO. 1

Pollutant	Ethyl Benzene	Methyl Ethyl Ketone	Methyl Isobutyl Ketone	Naphthalene	Styrene	Toluene	Xylenes (-m, -o, and -p isomers)	Aggregated HAPs
CAS No.	100-41-4	78-93-3	108-10-1	91-20-3	100-42-5	108-88-3	1330-20-7	
Potential Emission Rate (lb/day)	0.07 (0.07)	1.58 (2.1)	2.24 (4.2)	1.12 (1.4)	0.22 (0.28)	2.48 (2.8)	3.23 (3.5)	10.95 (14.4)
Potential Emission Rate (T/yr)	0.01 (0.01)	0.29 (0.38)	0.41 (0.77)	0.20 (0.26)	0.04 (0.05)	0.45 (0.51)	0.59 (0.64)	2.0 (2.62)

Table 7. POTENTIAL CRITERIA AIR POLLUTANT EMISSIONS – PAINT BOOTH NO. 2

Pollutant	PM/PM_{10}	O_3/VOC
Potential Emission Rate (lb/hr)	0.62 (0.62)	NA
Potential Emission Rate (lb/day)	5.21	120.70 (123.1)
Potential Emission Rate (T/yr)	0.95	22.44 (12.6)

Table 8. POTENTIAL HAZARDOUS AIR POLLUTANT EMISSIONS – PAINT BOOTH NO. 2

Pollutant	Ethyl Benzene	Methyl Ethyl Ketone	Methyl Isobutyl Ketone	Naphthalene	Styrene	Toluene	Xylenes (-m,-o, and -p isomers)	Aggre-gated HAPs
CAS No.	100-41-4	78-93-3	108-10-1	91-20-3	100-42-5	108-88-3	1330-20-7	
Potential Emission Rate (lb/day)	4.57 (4.6)	13.23 (11.3)	10.04 (10.1)	0.00 (5.9)	0.87 (0.84)	7.39 (10.1)	26.00 (9.2)	62.10 (68.9)
Potential Emission Rate (T/yr)	0.83 (0.8)	2.41 (2.1)	1.83 (1.8)	0.00 (1.1)	0.16 (0.2)	1.35 (1.8)	4.74 (4.8)	11.33 (12.6)

Table 9. SUMMARY OF POTENTIAL FACILITY-WIDE EMISSIONS FOR CHARMAC'S ORGINAL PROCESS DEFINITION

Pollutant	PM/ PM_{10}	Nitrogen Oxides (NO_x)	Sulfur Dioxide (SO_2)	Carbon Monoxide (CO)	Lead (Pb)	O_3/VOC	Aggregated HAPs
Potential Emission Rate (lb/hr)	1.26[a]	0.29	0.002	0.12	1.5 E-6	0.017[b]	NA
Potential Emission Rate (lb/day)	NA	NA	NA	NA	NA	134.9[c] (163.7)	73.2 (83.3)
Potential Emission Rate (T/yr)	1.87	1.25	0.008	0.53	6.6E-6	29.1 (20.0)	13.39[d] (15.2)

[a] Hourly PM/PM_{10} emissions estimated from Paint Booths no. 1 and no. 2 and aggregated natural gas-fired heaters.
[b] This value is only for the natural gas–fired space heaters. VOC emissions from the paint booths are included in the individual tables where the daily VOC emissions are listed.
[c] Daily VOC emissions reflect both paint spray booths and the solvent usage and recovery system's emissions. Welding and natural gas combustion are considered negligible on a daily basis.
[d] Value includes all HAPs sources for final verification that the facility is an area (or non-major) source of aggregated HAPs.

Table 10. STACK PARAMETERS FOR PAINT BOOTHS NOS. 1 AND 2

Emission Unit	Stack Height (ft)	Stack Diameter (ft)	Gas Velocity (fps[a])	Stack Temp. (K[b])
Paint Booth No.1 - Vent C	16	4 ft by 4ft square; 4.5 ft equivalent diameter	Vertical Release at 1.39 fps	293.15
Paint Booth No.2 - Vent A	15	4 ft x 3 ft square; 3.9 ft equivalent diameter	Horizontal Release; used 0.033 fps in modeling	293.15
Paint Booth No.2 - Vent B	15	4 ft x 3 ft square; 3.9 ft equivalent diameter	Horizontal Release; used 0.033 fps in modeling	293.15

[a]feet per second
[b]Kelvins

Revisions due to August 4, 2003 Facility Draft Comments

The facility draft comments from Charmac are intended to provide greater day-to-day operational flexibility in painting trailers and establishing compliance with emissions limits and operating requirements. DEQ's verification spreadsheets are contained in Attachments B and C of this memorandum. Charmac's facility draft comments are to be used in the permit, and the information pertaining to those comments is represented in Tables 11-15 of this memorandum.

Charmac's August 4, 2003 comments on the facility draft permit depict a slightly different process than presented in previous submittals. The facility wishes to use both paint booths to paint either black or white trailers, without operational restrictions on the color of paint and primers used in either spray booth. Charmac requests a limit of facility-wide usage of paint and primer of 27.3 gal/day, and 9,965 gal/yr, with emission limits of 175.8 lb/day and 32.1 T/yr for VOCs from both paint booths.

Charmac requests that the PM_{10} emissions be limited to 29.76 lb/day and 5.44 T/yr, as shown in Table 11. These levels of PM_{10} emissions are more conservative than emissions estimates that are supported by the process description submitted by Charmac in previous application submittals. PM_{10} emissions from the paint spray booths are directly related to the amount of paint and primer used by the spray guns. The amount of material sprayed by the guns is inherently limited by the amount of time it takes to paint each trailer within the paint booths. The amount of time it takes to complete these processes were stated to be limited to one hour out of a three hour cycle time to paint a cargo trailer, and two hours to paint a horse trailer out of a five hour cycle time. The requested allowable PM_{10} emissions rates do not follow this convention. However, the request is conservative, and provided these emissions rates were included in the modeling demonstration, the PTE values requested by Charmac for the paint spray booth vents can be established without the need for additional analysis.

Attachments B and C contain the DEQ verification analysis for Charmac's requested changes to the emissions. Attachment B contains DEQ's emission estimates based on the 27.3 gal/day, and 9,965 gal/yr, using black paint and black primer. Attachment C contains DEQ's emission estimates using 27.3 gal/day, and 9,965 gal/yr, using white paint and white primer. Attachment C also contains the emissions estimates for solvent usage.

In summary, Attachment A contains DEQ's verification of emission estimates to establish the facility's pre-permit PTE of regulated air pollutants incorporating inherent process limitations. Attachments B and C contain DEQ's verification analysis changes due to facility draft comments, which are requested for use in the final permit's emission limits. Attachment D of this memorandum contains emissions estimates for welding and natural gas combustion in space heaters.

Table 11. REQUESTED PERMIT EMISSIONS - PAINT SPRAY BOOTHS PM/PM_{10} EMISSIONS

Emission Unit	Uncontrolled Hourly Emission Rate (lb/hr)	Uncontrolled Annual Emission Rate (T/yr)	Controlled Hourly Emission Rate (lb/hr)	Controlled Daily Emission Rate (lb/day)	Controlled Annual Emission Rate (T/yr)
Paint Booth No. 1 Vent C	15.5	67.91	0.62	14.88	2.72
Paint Booth No. 2 Vent A	7.75	33.95	0.31	7.44	1.36
Paint Booth No. 2 Vent B	7.75	33.95	0.31	7.44	1.36
Totals	**31.0**	**135.81**	**1.24**	**29.76**	**5.44**

Tables 12, 13, and 14 contain information obtained from Charmac's facility draft permit comments dated August 4, 2003. DEQ's emission estimates are listed first, followed by Charmac's emission estimates in parentheses.

Table 12. REQUESTED PERMIT EMISSIONS - DAILY AND ANNUAL VOCS AND HAPS EMISSIONS FROM PAINT SPRAY BOOTHS NO. 1 AND NO. 2 BASED ON EXCLUSIVE USE OF WHITE PAINT AND WHITE PRIMER MIXTURES

Pollutant	Emissions Rate (lb/day)	Emissions Rate (T/yr)
VOCs	159.87 (161.5)	29.18 (29.2)
Individual HAPs:		
Ethyl Benzene	5.94 (6.05)	1.08 (1.1)
Methyl Ethyl Ketone	17.20 (14.9)	3.14 (2.7)
Methyl Isobutyl Ketone	13.05 (13.2)	2.38 (2.4)
Naphthalene	0.00 (7.7)	0.00 (1.4)
Styrene	1.13 (1.1)	0.21 (0.2)
Toluene	9.61 (13.2)	1.75 (2.4)
Xylenes	33.80 (34.1)	6.17 (6.2)
Aggregated HAPs	**80.73 (90.2)**	**14.73 (16.5)**

Table 13. REQUESTED PERMIT EMISSIONS - DAILY AND ANNUAL VOCS AND HAPS EMISSIONS FROM PAINT SPRAY BOOTHS NO. 1 AND NO. 2 BASED ON EXCLUSIVE USE OF BLACK PAINT AND BLACK PRIMER MIXTURES

Pollutant	Emissions Rate (lb/day)	Emissions Rate (T/yr)
VOCs	158.9 (175.8)	29.04 (32.1)
Individual HAPs:		
Ethyl Benzene	0.31 (0.3)	0.06 (0.05)
Methyl Ethyl Ketone	7.32 (9.1)	1.34 (1.7)
Methyl Isobutyl Ketone	9.70 (18.2)	1.77 (3.3)
Naphthalene	5.09 (6.1)	0.93 (1.1)
Styrene	0.97 (1.2)	0.19 (0.2)
Toluene	11.15 (12.1)	2.04 (2.2)
Xylenes (total)	14.21 (15.2)	2.60 (2.8)
Aggregated HAPs	**48.75 (62.1)**	**8.92 (11.3)**

Table 14. REQUESTED PERMIT EMISSIONS - DAILY AND ANNUAL VOCS AND HAPS EMISSIONS FROM PAINT SPRAY BOOTHS NO. 1 AND NO. 2 BASED ON WORST CASE REQUESTED EMISSIONS

Pollutant	Emissions Rate (lb/day)	Emissions Rate (T/yr)
VOCs	158.9 (175.8)	29.04 (32.1)
Individual HAPs:		
Ethyl Benzene	5.94 (6.05)	1.08 (1.1)
Methyl Ethyl Ketone	17.20 (14.9)	3.14 (2.7)
Methyl Isobutyl Ketone	9.70 (18.2)	1.77 (3.3)
Naphthalene	0.00 (7.7)	0.00 (1.4)
Styrene	0.97 (1.2)	0.19 (0.2)
Toluene	9.61 (13.2)	1.75 (2.4)
Xylenes (total)	33.80 (34.1)	6.17 (6.2)
Aggregated HAPs	**80.73 (90.2)**	**14.73 (16.5)**

White topcoat and white primer cause the worst-case emissions for all pollutants quantified, except for VOCs, methyl isobutyl ketone, and styrene. The values for black topcoat and primer are included in DEQ's emission estimate for worst-case daily and annual emissions of methyl ethyl ketone, which were slightly greater than those presented by Charmac. If the permit is drafted to include DEQ's values instead of Charmac's the requested potential emissions would be 17.20 lb/day and 3.14 T/yr of methyl ethyl ketone emissions, and the aggregated HAPs emissions would be increased to 92.5 lb/day and 16.94 T/yr. These alterations would not create any issues with Title V major source program applicability.

Solvent usage to clean paint guns and paint lines creates 0.33 lb/day, and 0.06 T/yr of VOCs emissions, with 0.17 lb/day and 0.03 T/yr of toluene emissions.

Table 15 contains a summary of the potential emissions from all sources at Charmac's facility. The emission rates reflect the requested daily and annual allowable emissions from Table 14 of this memorandum, paint booth solvent usage, welding emissions from calendar year 2001, and natural gas combustion emissions from space heating equipment.

Table 15. REQUESTED PERMIT EMISSIONS - SUMMARY OF POTENTIAL FACILITY-WIDE EMISSIONS

Pollutant	PM/PM_{10}	Nitrogen Oxides (NO_x)	Sulfur Dioxide (SO_2)	Carbon Monoxide (CO)	Lead (Pb)	O_3/VOC	Aggregated HAPs
Potential Emission Rate (lb/hr)[1]	1.27	0.29	1.82E-3	0.12	1.52E-6	7.36	3.77
Potential Emission Rate (lb/day)	29.77	6.84	0.04	2.88	3.65E-5	176.55	90.56
Potential Emission Rate (T/yr)	5.57	1.25	0.07	0.53	6.65E-6	32.23	16.53

[1] Pound per hour VOCs and HAPs emissions were estimated assuming the daily emissions were emitted at a constant rate over a 24-hour period.

3.4. Source Testing

No source test results were submitted in support of the application for consideration of the emissions inventory of regulated air pollutants.

3.5. Operating Parameters and Factors

Paint Booths Nos. 1 and 2

Operational Factors

PM, PM_{10}

Emissions of PM and PM_{10} are directly related to the following: solids content of the paint material (topcoat or primer), spray gun application rate, the number of spray guns within a spray booth, the number of spray booths, the type of surface being painted (this determines the amount of overspray), and the control efficiency of the fabric filter(s) on the spray booths.

Charmac used a value of 96% control efficiency to calculate PM and PM_{10} emissions from the exhaust vents, which are controlled by fabric filters. The information Charmac submitted in the permit application indicated the filters were capable of up to 96.5% control efficiency for paint overspray. A particle size distribution was not linked to the control efficiency. Regular inspection is required to determine when the loading capacity of the filter is reached and filter replacement is needed for the filters to perform at this level of efficiency. Pressure drop across the filter is the typical monitoring parameter used to examine operational efficiency of the exhaust filtration system. Increased pressure drop across the filter to a point where saturation has occurred, and particulate control efficiency is reduced below the stated efficiency, indicates that the fabric filter must be replaced. An increase in pressure drop of approximately 1.00 inches water column, gauge, was listed in the support information for the paint booth filters as the point where performance suffers and changeout should occur. The filter manufacturer's specifications and recommendations should be followed to assure proper control of particulate matter emissions.

Charmac's comments on the facility draft permit requested that the allowable emissions be altered to reflect continuous operation of both paint spray booths.

HAPs and VOCs

Emissions of HAPs and VOCs are directly related to the HAP and VOC content in the paints and primers, sprayer application rate, the number of guns operating within each spray booth, the number of spray booths, and the duration of the paint spraying process as limited by process bottlenecks. Charmac's representation of their inherent process limitations and the amounts and types of materials used are very important in quantifying these emissions. This does not apply for PM and PM_{10} emissions per facility draft comments.

Emissions of HAPs and VOCs, and to a lesser extent, of PM_{10}, are directly related to paint and primer daily and annual usage rates in each booth. Emissions of HAPs and VOCs are dependent upon coating color because each color of primer and topcoat mixture has its own chemical speciation. Paint usage is dependent upon the number of trailers processed in each paint booth, but creating a limitation solely on the number of trailers processed in the paint booths is only viable if the amounts of paint and primer mixtures applied to each trailer are also specified as limitations. The amount of primer and paint material applied per trailer may be a difficult parameter to monitor accurately, so tracking the amounts and compounds used on a daily basis is the best and simplest choice for surrogate parameters to quantify emissions or comply with emissions limitations. Emissions could be calculated using the paint product chemical speciation and the quantities of materials used on the time basis specified. The potential usage rates for both paint booths are listed below:

Paint Booths No.1 and No.2

The requested primer mixture and topcoat mixture may be limited to 27.3 gal/day and 9,965 gal/yr, as requested in Charmac's August 4, 2003 submittal. Color does not need to be specified because potential emissions estimates account for worst-case VOCs, HAPs, and PM_{10} emissions. The operating limit is applied to both paint booths. VOCs and HAPs emissions depend on paint and primer formulations. Formulations vary according to manufacturer and color. If enforceable emissions limits for VOCs, individual HAPs, and aggregated HAPs are included in the permit, detailed monitoring and recordkeeping may be needed to demonstrate compliance with the emissions limits. Emissions limits should be based on Charmac's values from the August 4, 2003 comments on the facility draft of the permit.

Daily and annual emissions limits for methyl ethyl ketone may be increased to 17.20 lb/day and 3.14 T/yr if the SSPO permit writer wishes to use a more conservative value derived by DEQ staff. Tier I major source program applicability is not affected by using the more conservative values. Charmac's requested emissions are more conservative than DEQ's for all other individual HAP and VOC. Monitoring and recordkeeping of actual individual HAP and VOCs emissions by the permittee can establish compliance with the permit limits. Information used by the permittee should be obtained from up-to-date material safety data sheets, provided by the material manufacturer.

The paint spray booths use a "Recyclit" waste solvent recycler as part of the maintenance process. Emissions of VOCs and HAPs caused by the daily spray gun and paint delivery line cleaning operations for each booth are directly dependent upon the quantity of MS-100 solvent actually introduced to each spray system and the control efficiency of the recycling unit. Use of the recycling unit is assumed to reduce VOCs and HAPs emissions by 90%. This facility's emissions inventory lists a small quantity of VOCs and toluene (a HAP) emissions from the spray gun cleaning and solvent recovery unit.

The recycling unit can generally be assumed to qualify as process equipment in that it is designed for material recovery, and therefore, creates economic savings for greatly reducing solvent purchases and hazardous waste recycling. However, the paint spray booths can operate without the unit, and did so, prior to its installation. Charmac's inventory viewed the solvent recycler as add-on process equipment.

Natural Gas-fired Space Heaters

Operational Factors

The space heaters' NO_x and PM_{10} emissions are related to the heat input capacity of the equipment. Each of the space heaters is fairly small in size, and even in aggregate, all units have only a heat input capacity of 3.1 MMBtu/hr. These are small sources of air pollutant emissions, even if operated continuously.

Welding

Operational Factors

Welding is a small source of emissions. The emissions values provided by Charmac were based upon actual 2001 calendar year production data, and are included in Table 15. Welding is a very small source of PM_{10} and HAPs emissions. Attachment D of this memorandum contains DEQ's verification calculations from welding. Only the data for the actual calendar year was applied to Table 15. Emissions of PM, PM_{10}, and HAPs due to GMAW depend upon the amount and type of welding rod used. Welding, as listed in the application materials, is an extremely small source of emissions at this facility.

DAM/bm T2-020412

ATTACHMENT A

DEQ Spreadsheet -

Review of Emissions Estimates

For Process Description Received

From Charmac on April 14, 2003

Charmac Trailers (Twin Falls, Idaho)
T2-020412
Darrin Mehr, Associate Air Quality Engineer, Technical Services Office

HAPs and VOCs Potential to Emit Estimates

Sources of Information
Charmac Trailers Application Materials
Source #
1) Tier II OP Application dated September 11, 2002
2) Supplemental Information for Tier II OP Application dated January 6, 2003
3) Letter titled "Historical Potential to Emit Estimates for Charmac Trailers Tier II Air Quality Permit Application" dated February 6, 2003
4) Letter titled "Historical Potential to Emit Estimates of Hazardous Air Pollutants (HAP) and Volatile Organic Compounds (VOC) for Charmac Trailers Tier II Air Quality Permit Application" received April 14, 2003

It is assumed that Item 4 replaces Item 3 as the basis for the PTE estimate. PTE equals the requested level of emissions.
Item 4 was created by the permittee to reflect their view of the process with revised information based on additional interviews with facility operators. The latest submittal alters the assumptions of % content and usage rates of primers, catalyst, reducer and accelerator in the primer and topcoat mixtures. Also, black primer and topcoat was used by Charmac for paint spray booth #1 (cargo trailers). This requires a complete revision to the existing DEQ review spreadsheet and technical memorandum.

The original submittal dated September 12, 2002 contains the Material Safety Data Sheets that have been used to estimate emissions.

This PTE inventory assumes that the facility's process is to be taken into account in the emission estimates.
White topcoat mixture and white primer are being used as the worst case coating combination to manufacture a horse trailer.

Black primer mixture and black topcoat mixture are assumed to reflect worst case for manufacturing cargo trailers.
Paint spray booth #1 will be reviewed using black primer and black topcoat, as requested by Charmac.

Solvents to clean spray guns between primer and topcoat applications are included in this analysis.

The coating material usage rate and the trailer throughput are independent for paint spray booths #1 and #2.
This spreadsheet will examine the material usage for each of the paint spray booths.

The constituents for white primer have been altered by Charmac in their latest submittal. The white primer is now composed of

primer, catalyst, and reducer.
The letter received on April 14, 2003 must be assumed to wholly replace earlier submittals for material usage rates, material composition, process design and the maximum capacity of this facility. Charmac's submittal has been accepted by DEQ as maximum daily and maximum annual capacity for trailer throughput and material usage.

HORSE TRAILERS - PAINT SPRAY BOOTH #2

PTE is based on a maximum daily production rate of trailers. This maximum daily production rate is then used to estimate an annual potential production rate. Potential emissions are then estimated using the daily and annual production rates and the material inventory's worst case solids, VOC, and HAPs constituents, as listed in the product MSDS sheets provided in the application materials.

Material Usage Rates

White Primer MIXTURE	3066 gal/yr	Annual usage based on 1533 horse trailers per year, 2 gallons white primer per horse trailer
	8.4 gal/day	Daily usage is based on 4.2 horse trailers per day, 2 gal white primer per horse trailer
White Top Coat Mixture	4,599 gal/yr	Annual usage based on 1533 horse trailers per year, 3 gallons white topcoat per horse trailer
	12.6 gal/day	Daily usage is based on 4.2 horse trailers per day, 3 gal white topcoat per horse trailer

Pollutant Emission Rate (lb/day or lb/yr) = Usage Rate (gal/yr or gal/day) x Mat'l Density (lb/gal) x Speciated Pollutant Content (%/100)

Potential to Emit VOCs and HAPs

Paint Spray Booth #2

White Primer MIXTURE (primer paint, catalyst, reducer) REVISED BASED ON LAST SUBMITTAL

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
White Primer Paint (DP48LF)	1.14	57.00	4.79	1747.62	11.9	56.98	20796.7
Reducer (MR187)	0.29	14.50	1.22	444.57	6.93	8.44	3080.9
Catalyst (MRDP401LF)	0.57	28.50	2.39	873.81	7.32	17.52	6396.3
Totals:	2	*100.00*	*8.40*	*3066.00*		82.94	*30273.8*

White Primer Mixture

Specific Pollutant	CAS #	White Primer Paint DP48LF (%)	Reducer MR 187 (%)	Catalyst MR DP401LF (%)	
VOCs (criteria pollutant)	NONE	61.1	100	73	
Hazardous Air Pollutants:					
Ethyl Benzene	100-41-4	0	1	0	
Methyl Ethyl Ketone	78-93-3	0	20	0	
Methyl Isobutyl Ketone	108-10-1	10	0	0	
Naphthalene	91-20-3	0	0	0	The percentage content of naphthalene in DP48LF is zero
Styrene	100-42-5	0	0	0	If you put a value of 10% in this space (like in the original
Toluene	108-88-3	5	20	0	submittal) you get 1 T/yr. Zero is correct.
Xylenes (m, p, o isomers)	1330-20-7	6	10	20	Toluene was listed as 10% content in the original submittal

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = Daily Emission Rate (lb/day) X 365 Days per year

POTENTIAL EMISSIONS DAILY BASIS-WHITE PRIMER MIXTURE

Specific Pollutant	CAS #	White Primer paint DP48LF (lb/day)	Reducer MR 187 (lb/day)	Catalyst MR DP401LF (lb/day)	TOTAL (lb/day)
VOCs	NA	34.84	8.44	12.79	56.05
Ethyl Benzene	100-41-4	0.00	0.06	0.00	0.06
Methyl Ethyl Ketone	78-93-3	0.00	1.69	0.00	1.69
Methyl Isobutyl Ketone	108-10-1	5.70	0.00	0.00	5.70
Naphthalene	91-20-3	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00
Toluene	108-88-3	2.85	1.69	0.00	4.54
Xylenes (m, p, o isomers)	1330-20-7	2.85	0.84	3.50	7.20

POTENTIAL EMISSIONS - ANNUAL BASIS WHITE PRIMER MIXTURE

Specific Pollutant	CAS #	White Primer paint DP48LF (lb/year)	Reducer MR 187 (lb/year)	Catalyst MR DP401LF (lb/year)	White PRIMER Mixture Annual Emissions (lb/yr)	White PRIMER Mixture Annual Emissions (Tons/yr)
VOCs	NA	12706.77	3080.87	4669.29	20466.93	10.23
Ethyl Benzene	100-41-4	0.00	30.81	0.00	30.81	0.02
Methyl Ethyl Ketone	78-93-3	0.00	616.17	0.00	616.17	0.31
Methyl Isobutyl Ketone	108-10-1	2079.67	0.00	0.00	2079.67	1.04
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00	0.00
Toluene	108-88-3	1039.83	616.17	0.00	1656.01	0.83
Xylenes (m, p, o isomers)	1330-20-7	1039.83	308.09	1279.26	2627.18	1.31
				VOCs	20467	10.23
		Aggregated HAPs:			7010	3.50

White Top Coat Mixture

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
White Base (M 301)	1.97	65.67	8.27	3020.01	10.5	86.68	31710.1
Reducer (MR 187)	0.49	16.33	2.06	751.17	6.93	14.26	5205.6
Hardener (MFA 360)	0.49	16.33	2.06	751.17	8.82	18.16	6626.3
Accelerator (MX 200)	0.05	1.67	0.21	76.65	8.16	1.71	624.7
Totals:	3	*100.00*	*12.60*	*4500.00*		*121.00*	*44166.7*

White Topcoat Mixture Composition

Specific Pollutant	CAS #	White Topcoat Base M 301 (%)	Reducer MR 187 (%)	Hardener MFA 360 (%)	Accelerator MX 200 (%)
VOCs (criteria pollutant)		53	100	31	58.4
Hazardous Air Pollutants:					
Ethyl Benzene	100-41-4	5	1	0	0
Methyl Ethyl Ketone	78-93-3	10	20	0	0
Methyl Isobutyl Ketone	108-10-1	5	0	0	0
Naphthalene	91-20-3	0	0	0	0
Styrene	100-42-5	1	0	0	0
Toluene	108-88-3	0	20	0	0
Xylenes (m, p, o isomers)	1330-20-7	20	10	0	0

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

POTENTIAL EMISSIONS DAILY BASIS-WHITE TOPCOAT

Specific Pollutant	CAS #	White Topcoat Base M 301 (lb/day)	Reducer MR 187 (lb/day)	Hardener MFA 360 (lb/day)	Accelerator MX 200 (lb/day)	TOTAL (lb/day)
VOCs	NA	46.04	14.26	5.63	1.00	66.93
Ethyl Benzene	100-41-4	4.34	0.14	0.00	0.00	4.49
Methyl Ethyl Ketone	78-93-3	8.69	2.85	0.00	0.00	11.54
Methyl Isobutyl Ketone	108-10-1	4.34	0.00	0.00	0.00	4.34
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.87	0.00	0.00	0.00	0.87
Toluene	108-88-3	0.00	2.86	0.00	0.00	2.86
Xylenes (m, p, o isomers)	1330-20-7	17.38	1.43	0.00	0.00	18.80

POTENTIAL EMISSIONS - ANNUAL BASIS - WHITE TOPCOAT

Specific Pollutant	CAS #	White Topcoat Base M 301 (lb/year)	Reducer MR 187 (lb/year)	Hardener MFA 360 (lb/year)	Accelerator MX 200 (lb/year)	White Topcoat Mixture Annual Emissions (lb/yr)	White Topcoat Mixture Annual Emissions (Tons/yr)
VOCs	NA	16806.36	5205.61	2053.86	364.82	24430.64	12.215
Ethyl Benzene	100-41-4	1585.51	52.06	0.00	0.00	1637.56	0.819
Methyl Ethyl Ketone	78-93-3	3171.01	1041.12	0.00	0.00	4212.13	2.106
Methyl Isobutyl Ketone	108-10-1	1585.51	0.00	0.00	0.00	1585.51	0.793
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00	0.000
Styrene monomer	100-42-5	317.10	0.00	0.00	0.00	317.10	0.159
Toluene	108-88-3	0.00	1041.12	0.00	0.00	1041.12	0.521
Xylenes (m, p, o isomers)	1330-20-7	6342.02	520.56	0.00	0.00	6862.58	3.431
				VOCs		*24431*	*12.22*
				Aggregated HAPs:		*15656*	*7.83*

PAINT SPRAY BOOTH #2 SUMMARY FOR PERMIT INVENTORY

POTENTIAL EMISSIONS - DAILY BASIS - Horse Trailer Painting - White primer and topcoat Summary

Specific Pollutant	CAS #	White PRIMER Mixture Daily Emissions (lb/day)	White Topcoat Mixture Daily Emissions (lb/day)	TOTAL DAILY EMISSIONS White Horse Trailer Pntg (lb/day)
VOCs	NA	56.046	66.933	122.98
Ethyl Benzene	100-41-4	0.084	4.486	4.57
Methyl Ethyl Ketone	78-93-3	1.688	11.540	13.22
Methyl Isobutyl Ketone	108-10-1	5.698	4.344	10.04
Naphthalene	91-20-3	0.000	0.000	0.00
Styrene monomer	100-42-5	0.000	0.869	0.87
Toluene	108-88-3	4.537	2.862	7.39
Xylenes (m, p, o isomers)	1330-20-7	7.198	18.802	26.00

Daily Aggregated HAPs = 62.10 lb/day

PAINT SPRAY BOOTH #2

POTENTIAL EMISSIONS - ANNUAL BASIS - Horse Trailer Painting - White primer and topcoat Summary

Specific Pollutant	CAS #	White PRIMER Mixture Annual Emissions (Tons/yr)	White Topcoat Mixture Annual Emissions (Tons/yr)	TOTAL ANNUAL EMISSIONS White Horse Trailer Pntg (Tons/yr)
VOCs	NA	10.228	12.216	22.44
Ethyl Benzene	100-41-4	0.018	0.819	0.83
Methyl Ethyl Ketone	78-93-3	0.308	2.106	2.41
Methyl Isobutyl Ketone	108-10-1	1.040	0.793	1.83
Naphthalene	91-20-3	0.000	0.000	0.00
Styrene monomer	100-42-5	0.000	0.159	0.16
Toluene	108-88-3	0.828	0.521	1.35
Xylenes (m, p, o isomers)	1330-20-7	1.314	3.431	4.74

Annual Aggregated HAPs 11.33 T/yr

CARGO TRAILERS - PAINT SPRAY BOOTH #1

PTE is based on a maximum daily production rate of trailers. This maximum daily production rate is then used to estimate an annual potential production rate. Potential emissions are then estimated using the daily and annual production rates and the material inventory's worst case solids, VOC, and HAPs constituents, as listed in the product MSDS sheets provided in the application materials.

Material Usage Rates

Black Primer MIXTURE	1277.5 gal/yr	Annual usage based on 2555 cargo trailers per year, 0.5 gallons black primer mixture per trailer
	3.5 gal/day	Daily usage is based on 7 cargo trailers per day, 0.5 gal black prim mixture per trailer
Black Top Coat Mixture	1,022 gal/yr	Annual usage based on 2555 cargo trailers per year, 0.4 gallons black topcoat per trailer
	2.8 gal/day	Daily usage is based on 7 cargo trailers per day, 0.4 gal black topcoat per cargo trailer

Pollutant Emission Rate (lb/day or lb/yr) = Usage Rate (gal/yr or gal/day) x Mat'l Density (lb/gal) x Speciated Pollutant Content (%/100)

BLACK PRIMER MIXTURE (primer paint, catalyst, reducer) REVISED BASED ON LAST SUBMITTAL received 4/18/03

Usage Rate Information

			Volumetric Basis			Weight Basis	
Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Daily Usage Rate (gallons/day)	Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Daily Usage Rate (lb/day)	Annual Usage Rate (lb/year)
Black Primer Paint (DP90LF)	0.29	58.00	2.03	740.96	11.04	22.41	8180.1
Reducer (MR187)	0.07	14.00	0.49	178.85	6.93	3.40	1239.4
Catalyst (MRDP401LF)	0.14	28.00	0.98	357.70	7.32	7.17	2618.4
Totals:	*0.5*	*100.00*	*3.50*	*1277.50*		*32.98*	*12037.9*

Black Primer Mixture

Specific Pollutant	CAS #	Black Primer Paint DP90LF (%)	Reducer MR 187 (%)	Catalyst MR DP401LF (%)
VOCs (criteria pollutant)	NONE	61.1	100	73
Hazardous Air Pollutants:				
Ethyl Benzene	100-41-4	0	1	0
Methyl Ethyl Ketone	78-93-3	0	20	0
Methyl Isobutyl Ketone	108-10-1	10	0	0
Naphthalene	91-20-3	0	0	0
Styrene	100-42-5	0	0	0
Toluene	108-88-3	5	20	0
Xylenes (m, p, o isomers)	1330-20-7	5	10	20

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

POTENTIAL EMISSIONS-DAILY BASIS-BLACK PRIMER MIXTURE

Specific Pollutant	CAS #	Black Primer paint DP90LF (lb/day)	Reducer MR 187 (lb/day)	Catalyst MR DP401LF (lb/day)	TOTAL (lb/day)
VOCs	NA	13.69	3.40	5.24	22.33
Ethyl Benzene	100-41-4	0.00	0.03	0.00	0.03
Methyl Ethyl Ketone	78-93-3	0.00	0.68	0.00	0.68
Methyl Isobutyl Ketone	108-10-1	2.24	0.00	0.00	2.24
Naphthalene	91-20-3	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00
Toluene	108-88-3	1.12	0.68	0.00	1.80
Xylenes (m, p, o isomers)	1330-20-7	1.12	0.34	1.43	2.89

POTENTIAL EMISSIONS - ANNUAL BASIS - BLACK PRIMER MIXTURE

Specific Pollutant	CAS #	Black Primer paint DP90LF (lb/year)	Reducer MR 187 (lb/year)	Catalyst MR DP401LF (lb/year)	Black PRIMER Mixture Annual Emissions (lb/yr)	Black PRIMER Mixture Annual Emissions (Tons/yr)
VOCs	NA	4998.03	1239.43	1911.41	8148.87	4.07
Ethyl Benzene	100-41-4	0.00	12.39	0.00	12.39	0.01
Methyl Ethyl Ketone	78-93-3	0.00	247.89	0.00	247.89	0.12
Methyl Isobutyl Ketone	108-10-1	818.01	0.00	0.00	818.01	0.41
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00	0.00
Toluene	108-88-3	409.00	247.89	0.00	656.89	0.33
Xylenes (m, p, o isomers)	1330-20-7	409.00	123.94	523.67	1056.62	0.53
			VOCs		8149	4.07
			Aggregated HAPs:		2792	1.40

BLACK TOPCOAT MIXTURE

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
Black Topcoat Paint (ALK300)	0.32	80.00	2.24	817.60	10.6	23.62	8684.6
Reducer (MR187)	0.08	20.00	0.56	204.40	6.93	3.88	1416.6
Totals:	*0.4*	*100.00*	*2.80*	*1022.00*		*27.40*	*10001.3*

Black Topcoat Mixture

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (%)	Reducer MR 187 (%)
VOCs (criteria pollutant)	NONE	44.7	100
Hazardous Air Pollutants:			
Ethyl Benzene	100-41-4	0	1
Methyl Ethyl Ketone	78-93-3	1	20
Methyl Isobutyl Ketone	108-10-1	0	0
Naphthalene	91-20-3	5	0
Styrene	100-42-5	1	0
Toluene	108-88-3	0	20
Xylenes (m, p, o isomers)	1330-20-7	0	10

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

POTENTIAL EMISSIONS-DAILY BASIS-BLACK TOPCOAT MIXTURE

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (lb/day)	Reducer MR 187 (lb/day)	TOTAL (lb/day)
VOCs	NA	10.51	3.86	14.39
Ethyl Benzene	100-41-4	0.00	0.04	0.04
Methyl Ethyl Ketone	78-93-3	0.24	0.78	1.01
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00
Naphthalene	91-20-3	1.18	0.00	1.18
Styrene monomer	100-42-5	0.24	0.00	0.24
Toluene	108-88-3	0.00	0.78	0.78
Xylenes (m, p, o isomers)	1330-20-7	0.00	0.39	0.39

POTENTIAL EMISSIONS - ANNUAL BASIS - BLACK TOPCOAT MIXTURE

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (lb/year)	Reducer MR 187 (lb/year)	Black Topcoat Mixture Annual Emissions (lb/yr)	Black Topcoat Mixture Annual Emissions (Tons/yr)
VOCs	NA	3837.41	1416.49	5253.90	2.63
Ethyl Benzene	100-41-4	0.00	14.16	14.16	0.01
Methyl Ethyl Ketone	78-93-3	85.86	283.30	369.16	0.18
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00	0.00
Naphthalene	91-20-3	429.24	0.00	429.24	0.21
Styrene monomer	100-42-5	85.86	0.00	85.86	0.04
Toluene	108-88-3	0.00	283.30	283.30	0.14
Xylenes (m, p, o isomers)	1330-20-7	0.00	141.65	141.65	0.07
		VOCs		5254	2.63
		Aggregated HAPs:		1323	0.66

PAINT SPRAY BOOTH #1 SUMMARY FOR PERMIT INVENTORY

POTENTIAL EMISSIONS - PAINT SPRAY BOOTH #1 - DAILY BASIS - CARGO Trailer Painting - Black primer and topcoat Summary

Specific Pollutant	CAS #	Black Primer Mixture Daily Emissions (lb/day)	Black Topcoat Mixture Daily Emissions (lb/day)	TOTAL Daily EMISSIONS Black Cargo Trailer Pntg (lb/day)	
VOCs	NA	22.33	14.394	36.72	
Ethyl Benzene	100-41-4	0.03	0.039	0.07	
Methyl Ethyl Ketone	78-93-3	0.68	1.011	1.69	
Methyl Isobutyl Ketone	108-10-1	2.24	0.000	2.24	
Naphthalene	91-20-3	0.00	1.176	1.18	
Styrene monomer	100-42-5	0.00	0.236	0.24	
Toluene	108-88-3	1.80	0.776	2.58	
Xylenes (m, p, o isomers)	1330-20-7	2.89	0.388	3.28	
			Total VOCs	36.72	lb/day
			Agg. HAPs	11.27	lb/day

POTENTIAL EMISSIONS PAINT SPRAY BOOTH #1 - ANNUAL BASIS - CARGO Trailer Painting - Black primer and topcoat Summary

Specific Pollutant	CAS #	Black Primer Mixture Annual Emissions (Tons/yr)	Black Topcoat Mixture Annual Emissions (Tons/yr)	TOTAL ANNUAL EMISSIONS Black Cargo Trailer Pntg (Tons/yr)	
VOCs	NA	4.074	2.627	6.70	
Ethyl Benzene	100-41-4	0.006	0.007	0.01	
Methyl Ethyl Ketone	78-93-3	0.124	0.185	0.31	
Methyl Isobutyl Ketone	108-10-1	0.409	0.000	0.41	
Naphthalene	91-20-3	0.000	0.215	0.21	
Styrene monomer	100-42-5	0.000	0.043	0.04	
Toluene	108-88-3	0.328	0.142	0.47	
Xylenes (m, p, o isomers)	1330-20-7	0.528	0.071	0.60	
			Total VOCs	6.70	T/yr
			Agg. HAPs	2.06	T/yr

SOLVENT RECOVERY SYSTEM -
Solvent-Related Emissions, (PPG, Inc. MS-100 general solvent is all that is represented here)

Density	6.66 lb per gallon (or lb/gal)	
Solvent	0.25 gal per booth	1.665 lb/booth
	0.5 gal per day	3.33 lb/day
	182.5 gal per year	1215.45 lb/yr
Charmac's Assumptions		
10% Solvent loss	0.025 gal per booth	0.1665 lb/booth
10% is emitted	0.05 gal per day	0.333 lb/day
	18.25 gal per year	121.545 lb/yr

Solvent Usage Potential Emissions

Pollutant	Chemical Abstract Service #	% Content	Daily Emissions (lb/day)	Annual Emissions (lb/year)	Annual Emissions (T/yr)
VOCs	NA	100	0.333	121.55	0.061
Toluene (HAP)	108-28-3	60	0.167	60.77	0.030

SUMMARY SECTION: Facility-Wide PTE for HAPs and VOCs

White Primer + White Top Coat Mixture + Black Primer + Black Top Coat Mixture + Solvent Usage + Natural Gas Combustion + Welding

AGGREGATED HAPS and VOCs

Process		Agg. HAPs (T/yr)	VOCs (T/yr)	Daily VOCS (lb/day)
White Primer Mixture	Booth #2	3.6	10.23	66.06
White Topcoat Mixture	Booth #2	7.83	12.22	66.93
Black Primer Mixture	Booth #1	1.40	4.07	22.33
Black Topcoat Mixture	Booth #1	0.88	2.63	14.39
Solvents (just MS100)	Both Booths	0.030	0.061	0.33
Welding		0.001	NA	NA
Natural Gas Combustion		0.026	0.073148	0.40
	Totals:	13.45	29.28	169.4

FACILITY-WIDE INDIVIDUAL HAPs

Pollutant		(T/yr)
Ethyl Benzene	100-41-4	0.88
Methyl Ethyl Ketone	78-93-3	2.72
Methyl Isobutyl Ketone	108-10-1	2.24
Naphthalene	91-20-3	0.21
Styrene monomer	100-42-5	0.20
Toluene	108-88-3	1.86
Xylenes (m, p, o isomers)	1330-20-7	6.34
	Total:	13.42

Note: Individual welding HAPs and natural gas combustions HAPs are not included in this table, because they are almost inconsequential for the permit. The individual HAPs from welding and natural gas combustion are different from those of the paint booths. These values are from paint spray booths 1 and 2 and the solvent usage used to clean sprayer lines in those booths.

PM = PM10 emissions in the absence of supporting technical information on the particle size fractions.

Product Density	7.6 lb/gallon
Application Rate	6.8 gallon/hr
Number of spray guns	2
Overspray	30 %
Pre-permit control efficiency	0 %

(for pre-permit PTE)

Uncontrolled

Emission Rate = Product Density (lb/gal) x Application Rate (gal/hr) x # guns x overspray (%/100) x (1 - (control efficiency/100))

31.008 lb PM and PM10/hr — Annual pre-permit PTE

15.504 lb PM and PM10/hr per spray gun

Controlled Emissions

Product Density	7.6	lb/gallon
Application Rate	6.8	gallon/hr
Number of spray guns	2	
Overspray	30	%
Filter control efficiency	96	%

The manufacturer's guarantee for particulate control ranges from 85% to 96% control efficiency. Use of the highest efficiency warrants increased monitoring and recordkeeping of pressure drop across the filter and immediate replacement when the recommended pressure drop is reached.

Emission Rate = Product Density (lb/gal) x Application Rate (gal/hr) x # guns x overspray (%/100) x (1 - (control efficiency/100))

1.24 lb PM-10 / hr BOTH spray guns

0.62 lb PM-10 / hr per spray gun or booth CONTROLLED

0.078 grams / second per spray booth

PM-10 Emissions

Paint Spray Booth #1	
Vent C	0.078 gram/sec
Paint Spray Booth #2	
Vent A	0.039 gram/sec
Vent B	0.039 gram/sec

Vents A and B on spray booth #2 exhaust emissions equally.

Pre-Permit PTE of Paint Spraying Operations: PM-10 Emissions

Assumptions: Worst case emissions rate for each spray gun, based upon white primer solids content.
The latest interpretation of Charmac's process for bottlenecks, and thus actual spray painting time.

Source	Paint spray Duration per Trailer (hrs)	Potential # Trailers per day	Uncontrolled PM and PM-10 Emission Rate (lb/hr)	Operating Days per Year	Conversion Factor (lb/ton)	Controlled Daily Emissions (lb/day)	Uncontrolled Annual Emissions (T/yr)	Controlled Annual Emissions (T/yr)
Paint Booth #1: Cargo Trailers	1	7	15.5	365	2000	4.34	19.80	0.79
Paint Booth #2: Horse Trailers	2	4.2	15.5	365	2000	5.21	23.76	0.95

Controlled Paint Spray Emissions:	1.74 T/yr PM and PM-10
Uncontrolled Paint Spray Emissions:	43.56 T/yr PM and PM-10

Therefore, non-major pre-permit, based on intrinsic bottlenecks on the process, and PM-10 PTE for other sources

ATTACHMENT B

DEQ Spreadsheet –

Review of Emissions Estimates

Facility-wide Use of Black Paint and Black Primer,

Based on Submittal from Charmac, dated August 4, 2003

PAINT SPRAY BOOTHS #1 AND #2 AND SOLVENT USAGE SECTION

Paint Spray Booths #1 and #2 - 100% Black Paint - Topcoat and Primer

Material Usage Rates All usage rates were requested to be revised in Charmac's facility draft comments dated August 4, 2003.

Black Primer MIXTURE	5536 gal/yr	Annual usage based on 11072 cargo trailers per year, 0.5 gallons black primer mixture per trailer
	15.15 gal/day	Daily usage is based on 30.3 cargo trailers per day, 0.5 gal black primer mixture trailer
Black Top Coat Mixture	4,429 gal/yr	Annual usage based on 11072 cargo trailers per year, 0.4 gallons black topcoat per trailer
	12.1 gal/day	Daily usage is based on 30.3 cargo trailers per day, 0.4 gal black topcoat per cargo trailer

Pollutant Emission Rate (lb/day or lb/yr) = Usage Rate (gal/yr or gal/day) x Mat'l Density (lb/gal) x Speciated Pollutant Content (%/100)

BLACK Topcoat/Primer	**9,965 GAL/YR**
USAGE RATES	**27.3 GAL/DAY**

BLACK PRIMER MIXTURE (primer paint, catalyst, reducer) REVISED BASED ON the following submittal: received 4/18/03

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
Black Primer Paint (DP90LF)	0.29	58.00	8.79	3210.88	11.04	97.01	35448.1
Reducer (MR187)	0.07	14.00	2.12	775.04	6.93	14.70	5371.0
Catalyst (MRDP401LF)	0.14	28.00	4.24	1550.08	7.32	31.05	11346.6
Totals:	0.5	100.00	15.15	5536.00		142.76	52165.7

Black Primer Mixture

Specific Pollutant	**CAS #**	**Black Primer Paint DP90LF (%)**	**Reducer MR 187 (%)**	**Catalyst MR DP401LF (%)**
VOCs (criteria pollutant)	NONE	61.1	100	73
Hazardous Air Pollutants:				
Ethyl Benzene	100-41-4	0	1	0
Methyl Ethyl Ketone	78-93-3	0	20	0
Methyl Isobutyl Ketone	108-10-1	10	0	0
Naphthalene	91-20-3	0	0	0
Styrene	100-42-5	0	0	0
Toluene	108-88-3	5	20	0
Xylenes (m, p, o isomers)	1330-20-7	5	10	20

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

PAINT SPRAY BOOTHS #1 AND #2 AND SOLVENT USAGE SECTION

POTENTIAL EMISSIONS-DAILY BASIS-BLACK PRIMER MIXTURE

Specific Pollutant	CAS #	Black Primer paint DP90LF (lb/day)	Reducer MR 187 (lb/day)	Catalyst MR DP401LF (lb/day)	TOTAL (lb/day)
VOCs	NA	59.27	14.70	22.67	96.64
Ethyl Benzene	100-41-4	0.00	0.15	0.00	0.15
Methyl Ethyl Ketone	78-93-3	0.00	2.94	0.00	2.94
Methyl Isobutyl Ketone	108-10-1	9.70	0.00	0.00	9.70
Naphthalene	91-20-3	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00
Toluene	108-88-3	4.85	2.94	0.00	7.79
Xylenes (m, p, o isomers)	1330-20-7	4.85	1.47	6.21	12.53

POTENTIAL EMISSIONS - ANNUAL BASIS - BLACK PRIMER MIXTURE

Specific Pollutant	CAS #	Black Primer paint DP90LF (lb/year)	Reducer MR 187 (lb/year)	Catalyst MR DP401LF (lb/year)	Black PRIMER Mixture Annual Emissions (lb/yr)	Black PRIMER Mixture Annual Emissions (Tons/yr)
VOCs	NA	21658.80	5371.03	8283.01	35312.83	17.66
Ethyl Benzene	100-41-4	0.00	53.71	0.00	53.71	0.03
Methyl Ethyl Ketone	78-93-3	0.00	1074.21	0.00	1074.21	0.54
Methyl Isobutyl Ketone	108-10-1	3544.81	0.00	0.00	3544.81	1.77
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00	0.00
Toluene	108-88-3	1772.41	1074.21	0.00	2846.61	1.42
Xylenes (m, p, o isomers)	1330-20-7	1772.41	537.10	2269.32	4578.83	2.29
				VOCs	35313	17.66
		Aggregated HAPs:			12098	6.05

PAINT SPRAY BOOTHS #1 AND #2 AND SOLVENT USAGE SECTION

BLACK TOPCOAT MIXTURE

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
Black Topcoat Paint (ALK300)	0.32	80.00	9.70	3543.04	10.5	101.81	37201.9
Reducer (MR187)	0.08	20.00	2.42	885.76	6.93	16.80	6138.3
Totals:	0.4	100.00	12.12	4428.80		118.61	43340.2

Black Topcoat Mixture

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (%)	Reducer MR 187 (%)
VOCs (criteria pollutant)	NONE	44.7	100
Hazardous Air Pollutants:			
Ethyl Benzene	100-41-4	0	1
Methyl Ethyl Ketone	78-93-3	1	20
Methyl Isobutyl Ketone	108-10-1	0	0
Naphthalene	91-20-3	5	0
Styrene	100-42-5	1	0
Toluene	108-88-3	0	20
Xylenes (m, p, o isomers)	1330-20-7	0	10

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)
CASE: 100% Black Topcoat and Primer Mixtures

POTENTIAL EMISSIONS-DAILY BASIS-BLACK TOPCOAT MIXTURE

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (lb/day)	Reducer MR 187 (lb/day)	TOTAL (lb/day)
VOCs	NA	45.51	16.80	62.31
Ethyl Benzene	100-41-4	0.00	0.17	0.17
Methyl Ethyl Ketone	78-93-3	1.02	3.36	4.38
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00
Naphthalene	91-20-3	5.09	0.00	5.09
Styrene monomer	100-42-5	0.97	0.00	0.97
Toluene	108-88-3	0.00	3.36	3.36
Xylenes (m, p, o isomers)	1330-20-7	0.00	1.68	1.68

POTENTIAL EMISSIONS - ANNUAL BASIS - BLACK TOPCOAT MIXTURE

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (lb/year)	Reducer MR 187 (lb/year)	Black Topcoat Mixture Annual Emissions (lb/yr)	Black Topcoat Mixture Annual Emissions (Tons/yr)
VOCs	NA	16629.26	6138.32	22767.58	11.38
Ethyl Benzene	100-41-4	0.00	61.38	61.38	0.03
Methyl Ethyl Ketone	78-93-3	372.02	1227.66	1599.68	0.80
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00	0.00
Naphthalene	91-20-3	1860.10	0.00	1860.10	0.93
Styrene monomer	100-42-5	372.02	0.00	372.02	0.19
Toluene	108-88-3	0.00	1227.66	1227.66	0.61
Xylenes (m, p, o isomers)	1330-20-7	0.00	613.83	613.83	0.31
		VOCs		22768	11.38
		Aggregated HAPs:		5735	2.87

POTENTIAL EMISSIONS - PAINT SPRAY BOOTHS #1 & #2- DAILY BASIS - 100% Black primer and topcoat Summary

Specific Pollutant	CAS #	Black Primer Mixture Daily Emissions (lb/day)	Black Topcoat Mixture Daily Emissions (lb/day)	TOTAL Daily EMISSIONS Black Cargo Trailer Pntg (lb/day)	
VOCs	NA	96.64	62.306	158.94	
Ethyl Benzene	100-41-4	0.15	0.168	0.31	
Methyl Ethyl Ketone	78-93-3	2.94	4.378	7.32	
Methyl Isobutyl Ketone	108-10-1	9.70	0.000	9.70	
Naphthalene	91-20-3	0.00	5.090	5.09	
Styrene monomer	100-42-5	0.00	0.970	0.97	
Toluene	108-88-3	7.79	3.360	11.15	
Xylenes (m, p, o isomers)	1330-20-7	12.53	1.680	14.21	
			Total VOCs	158.94	lb/day
			Agg. HAPs	46.75	lb/day

POTENTIAL EMISSIONS PAINT SPRAY BOOTH #1, #2 - ANNUAL BASIS - Black primer and topcoat Summary

Specific Pollutant	CAS #	Black Primer Mixture Annual Emissions (Tons/yr)	Black Topcoat Mixture Annual Emissions (Tons/yr)	TOTAL ANNUAL EMISSIONS Black Cargo Trailer Pntg (Tons/yr)	
VOCs	NA	17.656	11.384	29.04	
Ethyl Benzene	100-41-4	0.027	0.031	0.06	
Methyl Ethyl Ketone	78-93-3	0.537	0.800	1.34	
Methyl Isobutyl Ketone	108-10-1	1.772	0.000	1.77	
Naphthalene	91-20-3	0.000	0.930	0.93	
Styrene monomer	100-42-5	0.000	0.186	0.19	
Toluene	108-88-3	1.423	0.614	2.04	
Xylenes (m, p, o isomers)	1330-20-7	2.289	0.307	2.60	
			Total VOCs	29.04	T/yr
			Agg. HAPs	8.92	T/yr

SOLVENT RECOVERY SYSTEM -

Solvent-Related Emissions, (PPG, Inc. MS-100 general solvent is all that is represented here)

Density	6.66 lb per gallon (or lb/gal)	
Solvent	0.25 gal per booth	1.665 lb/booth
	0.5 gal per day	3.33 lb/day
	182.5 gal per year	1215.45 lb/yr
Charmec's Assumptions		
10% Solvent loss 10% is emitted	0.025 gal per booth	0.1665 lb/booth
	0.05 gal per day	0.333 lb/day
	18.25 gal per year	121.545 lb/yr

Solvent Usage Potential Emissions

Pollutant	Chemical Abstract Service #	% Content	Daily Emissions (lb/day)	Annual Emissions (lb/year)	Annual Emissions (T/yr)
VOCs	NA	100	0.333	121.55	0.061
Toluene (HAP)	108-28-3	50	0.167	60.77	0.030

SUMMARY SECTION: Facility-Wide PTE for HAPs and VOCs

White Primer + White Top Coat Mixture + Black Primer + Black Top Coat Mixture + Solvent Usage + Natural Gas Combustion + Welding

AGGREGATED HAPS and VOCs

Process		Agg. HAPs (T/yr)	VOCs (T/yr)	Daily VOCS (lb/day)
White Primer Mixture		0.0	0.00	0.00
White Topcoat Mixture		0.00	0.00	0.00
Black Primer Mixture	Booths 1 & 2	6.05	17.66	96.64
Black Topcoat Mixture	Booths 1 & 2	2.87	11.38	62.31
Solvents (just MS 100)	Both Booths	0.030	0.061	0.33
Welding		0.001	NA	NA
Natural Gas Combustion		0.025	0.073146	0.40
	Totals:	**8.97**	**29.17**	**159.7**

FACILITY-WIDE INDIVIDUAL HAPs

Pollutant		(T/yr)
Ethyl Benzene	100-41-4	0.06
Methyl Ethyl Ketone	78-93-3	1.34
Methyl Isobutyl Ketone	108-10-1	1.77
Naphthalene	91-20-3	0.93
Styrene monomer	100-42-5	0.19
Toluene	108-88-3	2.07
Xylenes (m, p, o isomers)	1330-20-7	2.60
	Total:	**8.95**

Note: Individual welding HAPs and natural gas combustions HAPs are not included in this table, because they are almost inconsequential for the permit. The individual HAPs from welding and natural gas combustion are different from those of the paint booths. These values are from paint spray booths 1 and 2 and the solvent usage used to clean sprayer lines in those booths.

ATTACHMENT C

DEQ Spreadsheet –

Review of Emissions Estimates

Facility-wide Use of White Paint and White Primer,

And PM/PM_{10} PTE Revisions,

Based on Submittal from Charmac, dated August 4, 2003

Charmac Trailers (Twin Falls, Idaho)
T2-020412
Darrin Mehr, Associate Air Quality Engineer, Technical Services Office
Date Last Worked On: 11/6/03
HAPs and VOCs Potential to Emit Estimates
Daily and Annual PM-10 Requested Potential to Emit Estimates

Sources of Information
Charmac Trailers Application Materials
Facility draft comments, submitted by Charmac, dated Aug 4, 2003 and received Aug. 7, 2003
All other information submitted prior to issuance of the permit as a facility draft was used to estimate pre-permit PTE based on Charmac's process assumptions.

This spreadsheet estimates VOCs and HAPs Emissions if the facility only sprayed white topcoat and white primer mixtures in both Paint Spray Booths #1 and #2. No black or other color topcoat or primer mixtures are included.

Material Usage Rates

White Primer MIXTURE	3986.6 gal/yr	Annual usage based on 1993 horse trailers per year, 2 gallons white primer per horse trailer
	10.92 gal/day	Daily usage is based on 5.46 horse trailers per day, 2 gal white primer per horse trailer
White Top Coat Mixture	5,978.7 gal/yr	Annual usage based on 1993 horse trailers per year, 3 gallons white topcoat per horse trailer
	16.38 gal/day	Daily usage is based on 5.5 horse trailers per day (**5.46 trailers per day to arrive at same usage values**) 3 gal white topcoat per horse trailer

FACILITY DRAFT REQUESTED PAINT USAGE LIMITATIONS	**27.3 GALLONS PER DAY** **9,965 GALLONS PER YEAR**

Pollutant Emission Rate (lb/day or lb/yr) = Usage Rate (gal/yr or gal/day) x Mat'l Density (lb/gal) x Speciated Pollutant Content (%/100)

Potential to Emit VOCs and HAPs

Paint Spray Booths No. 1 and No. 2
White Primer MIXTURE (primer paint, catalyst, reducer) Formulation is based on MSDS sheets and Charmac's submittal, received 4/14/03

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
White Primer Paint (DP48LF)	1.14	57.00	6.22	2271.91	11.9	74.07	27036.7
Reducer (MR187)	0.29	14.50	1.68	577.94	6.93	10.97	4005.1
Catalyst (MRDP401LF)	0.57	28.50	3.11	1135.98	7.32	22.78	8315.2
Totals:	2	100.00	10.92	3985.80		107.82	39356.0

White Primer Mixture

Specific Pollutant	CAS #	White Primer Paint DP48LF (%)	Reducer MR 187 (%)	Catalyst MR DP401LF (%)	
VOCs (criteria pollutant)	NONE	61.1	100	73	
Hazardous Air Pollutants:					
Ethyl Benzene	100-41-4	0	1	0	
Methyl Ethyl Ketone	78-93-3	0	20	0	
Methyl Isobutyl Ketone	108-10-1	10	0	0	
Naphthalene	91-20-3	0	0	0	The percentage content of naphthalene in DP48LF is zero
Styrene	100-42-5	0	0	0	If you put a value of 10% in this space (like in the orginal
Toluene	108-88-3	5	20	0	submittal) you get 1 T/yr. Zero is correct.
Xylenes (m, p, o isomers)	1330-20-7	5	10	20	Toluene was listed as 10% content in the original submittal.

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = Daily Emission Rate (lb/day) X 365 Days per year

Chemmc Trailers (Twin Falls)
Incorporates Facility Draft Comments

POTENTIAL EMISSIONS DAILY BASIS-WHITE PRIMER MIXTURE

Specific Pollutant	CAS #	White Primer paint DP48LF (lb/day)	Reducer MR 187 (lb/day)	Catalyst MR DP401LF (lb/day)	TOTAL (lb/day)
VOCs	NA	46.26	10.97	16.63	72.86
Ethyl Benzene	100-41-4	0.00	0.11	0.00	0.11
Methyl Ethyl Ketone	78-93-3	0.00	2.19	0.00	2.19
Methyl Isobutyl Ketone	108-10-1	7.41	0.00	0.00	7.41
Naphthalene	91-20-3	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00
Toluene	108-88-3	3.70	2.19	0.00	5.90
Xylenes (m, p, o isomers)	1330-20-7	3.70	1.10	4.66	9.36

POTENTIAL EMISSIONS - ANNUAL BASIS WHITE PRIMER MIXTURE

Specific Pollutant	CAS #	White Primer paint DP48LF (lb/year)	Reducer MR 187 (lb/year)	Catalyst MR DP401LF (lb/year)	White PRIMER Mixture Annual Emissions (lb/yr)	White PRIMER Mixture Annual Emissions (Tons/yr)
VOCs	NA	16618.60	4006.13	6070.08	26694.01	13.30
Ethyl Benzene	100-41-4	0.00	40.05	0.00	40.05	0.02
Methyl Ethyl Ketone	78-93-3	0.00	801.03	0.00	801.03	0.40
Methyl Isobutyl Ketone	108-10-1	2703.57	0.00	0.00	2703.57	1.35
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00	0.00
Toluene	108-88-3	1351.78	801.03	0.00	2152.81	1.08
Xylenes (m, p, o isomers)	1330-20-7	1351.78	400.51	1663.04	3415.33	1.71
			VOCs		26594	13.30
			Aggregated HAPs:		9113	4.56

White Top Coat Mixture
Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
White Base (M 301)	1.97	65.67	10.76	3926.01	10.5	112.94	41223.1
Reducer (MR 187)	0.49	16.33	2.68	976.62	6.93	18.54	6767.3
Hardener (MFA 360)	0.49	16.33	2.68	976.62	8.82	23.60	8612.9
Accelerator (MX 200)	0.05	1.67	0.27	99.68	8.16	2.22	812.1
Totals:	3	100.00	16.38	5978.70		157.30	57416.4

White Topcoat Mixture Composition

Specific Pollutant	CAS #	White Topcoat Base M 301 (%)	Reducer MR 187 (%)	Hardener MFA 360 (%)	Accelerator MX 200 (%)
VOCs (criteria pollutant)		63	100	31	58.4
Hazardous Air Pollutants:					
Ethyl Benzene	100-41-4	5	1	0	0
Methyl Ethyl Ketone	78-93-3	10	20	0	0
Methyl Isobutyl Ketone	108-10-1	5	0	0	0
Naphthalene	91-20-3	0	0	0	0
Styrene	100-42-5	1	0	0	0
Toluene	108-88-3	0	20	0	0
Xylenes (m, p, o isomers)	1330-20-7	20	10	0	0

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

Chermac Trailers (Twin Falls)
Incorporates Facility Draft Comments

POTENTIAL EMISSIONS DAILY BASIS-WHITE TOPCOAT

Specific Pollutant	CAS #	White Topcoat Base M 301 (lb/day)	Reducer MR 187 (lb/day)	Hardener MFA 360 (lb/day)	Accelerator MX 200 (lb/day)	TOTAL (lb/day)
VOCs	NA	59.86	18.54	7.32	1.30	87.01
Ethyl Benzene	100-41-4	5.65	0.19	0.00	0.00	5.83
Methyl Ethyl Ketone	78-93-3	11.29	3.71	0.00	0.00	15.00
Methyl Isobutyl Ketone	108-10-1	5.66	0.00	0.00	0.00	5.66
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	1.13	0.00	0.00	0.00	1.13
Toluene	108-88-3	0.00	3.71	0.00	0.00	3.71
Xylenes (m, p, o isomers)	1330-20-7	22.59	1.85	0.00	0.00	24.44

POTENTIAL EMISSIONS - ANNUAL BASIS - WHITE TOPCOAT

Specific Pollutant	CAS #	White Topcoat Base M 301 (lb/year)	Reducer MR 187 (lb/year)	Hardener MFA 360 (lb/year)	Accelerator MX 200 (lb/year)	White Topcoat Mixture Annual Emissions (lb/yr)	White Topcoat Mixture Annual Emissions (Tons/yr)
VOCs	NA	21848.26	6767.29	2670.00	474.27	31759.83	15.880
Ethyl Benzene	100-41-4	2061.16	67.67	0.00	0.00	2128.83	1.064
Methyl Ethyl Ketone	78-93-3	4122.31	1353.46	0.00	0.00	5475.77	2.738
Methyl Isobutyl Ketone	108-10-1	2061.16	0.00	0.00	0.00	2061.16	1.031
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00	0.000
Styrene monomer	100-42-5	412.23	0.00	0.00	0.00	412.23	0.206
Toluene	108-88-3	0.00	1353.46	0.00	0.00	1353.46	0.677
Xylenes (m, p, o isomers)	1330-20-7	8244.63	676.73	0.00	0.00	8921.36	4.461
					VOCs	31760	15.88
				Aggregated HAPs:		20353	10.18

PAINT SPRAY BOOTHS No. 1 and No. 2 SUMMARY FOR PERMIT INVENTORY

POTENTIAL EMISSIONS - DAILY BASIS - Horse Trailer Painting - White primer and topcoat Summary

Specific Pollutant	CAS #	White PRIMER Mixture Daily Emissions (lb/day)	White Topcoat Mixture Daily Emissions (lb/day)	TOTAL DAILY EMISSIONS White Horse Trailer Pntg (lb/day)
VOCs	NA	72.860	87.013	159.87
Ethyl Benzene	100-41-4	0.110	5.832	5.94
Methyl Ethyl Ketone	78-93-3	2.196	15.002	17.20
Methyl Isobutyl Ketone	108-10-1	7.407	5.647	13.05
Naphthalene	91-20-3	0.000	0.000	0.00
Styrene monomer	100-42-5	0.000	1.129	1.13
Toluene	108-88-3	5.896	3.706	9.61
Xylenes (m, p, o isomers)	1330-20-7	9.357	24.442	33.80

Daily Aggregated HAPs = 80.73 lb/day

PAINT SPRAY BOOTHS No. 1 and No. 2

POTENTIAL EMISSIONS - ANNUAL BASIS - White primer and topcoat Summary

Specific Pollutant	CAS #	White PRIMER Mixture Annual Emissions (Tons/yr)	White Topcoat Mixture Annual Emissions (Tons/yr)	TOTAL ANNUAL EMISSIONS White Horse Trailer Pntg (Tons/yr)
VOCs	NA	13.297	15.880	29.18
Ethyl Benzene	100-41-4	0.020	1.064	1.08
Methyl Ethyl Ketone	78-93-3	0.401	2.738	3.14
Methyl Isobutyl Ketone	108-10-1	1.352	1.031	2.38
Naphthalene	91-20-3	0.000	0.000	0.00
Styrene monomer	100-42-5	0.000	0.206	0.21
Toluene	108-88-3	1.076	0.677	1.75
Xylenes (m, p, o isomers)	1330-20-7	1.708	4.461	6.17

Annual Aggregated HAPs 14.73 T/yr

BLACK PAINT AND PRIMER

Material Usage Rates

Black Primer MIXTURE	0 gal/yr	Annual usage based on 2555 cargo trailers per year, 0.6 gallons black primer mixture per trailer
	0 gal/day	Daily usage is based on 7 cargo trailers per day, 0.6 gal black primer mixture trailer
Black Top Coat Mixture	0 gal/yr	Annual usage based on 2555 cargo trailers per year, 0.4 gallons black topcoat per trailer
	0.0 gal/day	Daily usage is based on 7 cargo trailers per day, 0.4 gal black topcoat per cargo trailer

Pollutant Emission Rate (lb/day or lb/yr) = Usage Rate (gal/yr or gal/day) x Mat'l Density (lb/gal) x Speciated Pollutant Content (%/100)

BLACK PRIMER MIXTURE (primer paint, catalyst, reducer) REVISED BASED ON LAST SUBMITTAL received 4/18/03

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
Black Primer Paint (DP90LF)	0.29	58.00	0.00	0.00	11.04	0.00	0.0
Reducer (MR187)	0.07	14.00	0.00	0.00	6.93	0.00	0.0
Catalyst (MRDP401LF)	0.14	28.00	0.00	0.00	7.32	0.00	0.0
Totals:	0.6	100.00	0.00	0.00		0.00	0.0

Black Primer Mixture

Specific Pollutant	CAS #	Black Primer Paint DP90LF (%)	Reducer MR 187 (%)	Catalyst MR DP401LF (%)
VOCs (criteria pollutant)	NONE	61.1	100	73
Hazardous Air Pollutants:				
Ethyl Benzene	100-41-4	0	1	0
Methyl Ethyl Ketone	78-93-3	0	20	0
Methyl Isobutyl Ketone	108-10-1	10	0	0
Naphthalene	91-20-3	0	0	0
Styrene	100-42-5	0	0	0
Toluene	108-88-3	5	20	0
Xylenes (m, p, o isomers)	1330-20-7	5	10	20

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

POTENTIAL EMISSIONS-DAILY BASIS-BLACK PRIMER MIXTURE

Specific Pollutant	CAS #	Black Primer paint DP90LF (lb/day)	Reducer MR 187 (lb/day)	Catalyst MR DP401LF (lb/day)	TOTAL (lb/day)
VOCs	NA	0.00	0.00	0.00	0.00
Ethyl Benzene	100-41-4	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	78-93-3	0.00	0.00	0.00	0.00
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00	0.00
Naphthalene	91-20-3	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00
Toluene	108-88-3	0.00	0.00	0.00	0.00
Xylenes (m, p, o isomers)	1330-20-7	0.00	0.00	0.00	0.00

POTENTIAL EMISSIONS - ANNUAL BASIS - BLACK PRIMER MIXTURE

Specific Pollutant	CAS #	Black Primer paint DP90LF (lb/year)	Reducer MR 187 (lb/year)	Catalyst MR DP401LF (lb/year)	Black PRIMER Mixture Annual Emissions (lb/yr)	Black PRIMER Mixture Annual Emissions (Tons/yr)
VOCs	NA	0.00	0.00	0.00	0.00	0.00
Ethyl Benzene	100-41-4	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	78-93-3	0.00	0.00	0.00	0.00	0.00
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00	0.00	0.00
Naphthalene	91-20-3	0.00	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00	0.00
Toluene	108-88-3	0.00	0.00	0.00	0.00	0.00
Xylenes (m, p, o isomers)	1330-20-7	0.00	0.00	0.00	0.00	0.00
			VOCs		0	0.00
			Aggregated HAPs:		0	0.00

BLACK TOPCOAT MIXTURE

Usage Rate Information

Mixture Components	Component Volume (gallons)	Component Percentage of the mixture (%)	Volumetric Basis: Daily Usage Rate (gallons/day)	Volumetric Basis: Annual Usage Rate (gallons/year)	Material Density (lb/gallon)	Weight Basis: Daily Usage Rate (lb/day)	Weight Basis: Annual Usage Rate (lb/year)
Black Topcoat Paint (ALK300)	0.32	80.00	0.00	0.00	10.6	0.00	0.0
Reducer (MR187)	0.08	20.00	0.00	0.00	6.93	0.00	0.0
Totals:	0.4	100.00	0.00	0.00		0.00	0.0

Black Topcoat Mixture

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (%)	Reducer MR 187 (%)
VOCs (criteria pollutant)	NONE	44.7	100
Hazardous Air Pollutants:			
Ethyl Benzene	100-41-4	0	1
Methyl Ethyl Ketone	78-93-3	1	20
Methyl Isobutyl Ketone	108-10-1	0	0
Naphthalene	91-20-3	6	0
Styrene	100-42-5	1	0
Toluene	108-88-3	0	20
Xylenes (m, p, o isomers)	1330-20-7	0	10

Daily Emissions (lb/day) = % Pollutant Content X (1/100) X Daily Material Usage on Weight Basis (lb/day)

Annual Emissions (lb/yr) = % Pollutant Content X (1/100) X Annual Material Usage on Weight Basis (lb/yr)

POTENTIAL EMISSIONS-DAILY BASIS-BLACK TOPCOAT MIXTURE

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (lb/day)	Reducer MR 187 (lb/day)	TOTAL (lb/day)
VOCs	NA	0.00	0.00	0.00
Ethyl Benzene	100-41-4	0.00	0.00	0.00
Methyl Ethyl Ketone	78-93-3	0.00	0.00	0.00
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00
Naphthalene	91-20-3	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00
Toluene	108-88-3	0.00	0.00	0.00
Xylenes (m, p, o isomers)	1330-20-7	0.00	0.00	0.00

POTENTIAL EMISSIONS - ANNUAL BASIS - BLACK TOPCOAT MIXTURE

Specific Pollutant	CAS #	Black Topcoat Paint ALK300 (lb/year)	Reducer MR 187 (lb/year)	Black Topcoat Mixture Annual Emissions (lb/yr)	Black Topcoat Mixture Annual Emissions (Tons/yr)
VOCs	NA	0.00	0.00	0.00	0.00
Ethyl Benzene	100-41-4	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	78-93-3	0.00	0.00	0.00	0.00
Methyl Isobutyl Ketone	108-10-1	0.00	0.00	0.00	0.00
Naphthalene	91-20-3	0.00	0.00	0.00	0.00
Styrene monomer	100-42-5	0.00	0.00	0.00	0.00
Toluene	108-88-3	0.00	0.00	0.00	0.00
Xylenes (m, p, o isomers)	1330-20-7	0.00	0.00	0.00	0.00
		VOCs		0	0.00
		Aggregated HAPs:		0	0.00

PAINT SPRAY BOOTHS No. 1 and No. 2 - SUMMARY FOR PERMIT INVENTORY

POTENTIAL EMISSIONS - PAINT SPRAY BOOTH #1 - DAILY BASIS -
CARGO Trailer Painting - Black primer and topcoat Summary

Specific Pollutant	CAS #	Black Primer Mixture Daily Emissions (lb/day)	Black Topcoat Mixture Daily Emissions (lb/day)	TOTAL Daily EMISSIONS Black Cargo Trailer Pntg (lb/day)	
VOCs	NA	0.00	0.000	0.00	
Ethyl Benzene	100-41-4	0.00	0.000	0.00	
Methyl Ethyl Ketone	78-93-3	0.00	0.000	0.00	
Methyl Isobutyl Ketone	108-10-1	0.00	0.000	0.00	
Naphthalene	91-20-3	0.00	0.000	0.00	
Styrene monomer	100-42-5	0.00	0.000	0.00	
Toluene	108-88-3	0.00	0.000	0.00	
Xylenes (m, p, o isomers)	1330-20-7	0.00	0.000	0.00	
			Total VOCs	0.00	lb/day
			Agg. HAPs	0.00	lb/day

POTENTIAL EMISSIONS PAINT SPRAY BOOTH #1 - ANNUAL BASIS -
CARGO Trailer Painting - Black primer and topcoat Summary

Specific Pollutant	CAS #	Black Primer Mixture Annual Emissions (Tons/yr)	Black Topcoat Mixture Annual Emissions (Tons/yr)	TOTAL ANNUAL EMISSIONS Black Cargo Trailer Pntg (Tons/yr)	
VOCs	NA	0.000	0.000	0.00	
Ethyl Benzene	100-41-4	0.000	0.000	0.00	
Methyl Ethyl Ketone	78-93-3	0.000	0.000	0.00	
Methyl Isobutyl Ketone	108-10-1	0.000	0.000	0.00	
Naphthalene	91-20-3	0.000	0.000	0.00	
Styrene monomer	100-42-5	0.000	0.000	0.00	
Toluene	108-88-3	0.000	0.000	0.00	
Xylenes (m, p, o isomers)	1330-20-7	0.000	0.000	0.00	
			Total VOCs	0.00	T/yr
			Agg. HAPs	0.00	T/yr

SOLVENT RECOVERY SYSTEM -
Solvent-Related Emissions, (PPG, Inc. MS-100 general solvent is all that is represented here)

Density	6.66 lb per gallon (or lb/gal)	
Solvent	0.25 gal per booth	1.665 lb/booth
	0.5 gal per day	3.33 lb/day
	182.5 gal per year	1215.45 lb/yr
Charmac's Assumptions		
10% Solvent loss 10% is emitted	0.025 gal per booth	0.1665 lb/booth
	0.05 gal per day	0.333 lb/day
	18.25 gal per year	121.545 lb/yr

Solvent Usage Potential Emissions

Pollutant	Chemical Abstract Service #	% Content	Daily Emissions (lb/day)	Annual Emissions (lb/year)	Annual Emissions (T/yr)
VOCs	NA	100	0.333	121.55	0.061
Toluene (HAP)	108-28-3	50	0.167	60.77	0.030

SUMMARY SECTION: Facility-Wide PTE for HAPs and VOCs

White Primer + White Top Coat Mixture + Black Primer + Black Top Coat Mixture + Solvent Usage + Natural Gas Combustion + Welding

AGGREGATED HAPS and VOCs

Process		Agg. HAPs (T/yr)	VOCs (T/yr)	Daily VOCS (lb/day)
White Primer Mixture	Booth #2	4.6	13.30	72.86
White Topcoat Mixture	Booth #2	10.18	15.86	87.01
Black Primer Mixture	Booth #1	0.00	0.00	0.00
Black Topcoat Mixture	Booth #1	0.00	0.00	0.00
Solvents (just MS100)	Both Booths	0.030	0.061	0.33
Welding		0.001	NA	NA
Natural Gas Combustion		0.025	0.073146	0.40
	Totals:	14.79	29.31	160.6

FACILITY-WIDE INDIVIDUAL HAPs

Pollutant		(T/yr)
Ethyl Benzene	100-41-4	1.08
Methyl Ethyl Ketone	78-93-3	3.14
Methyl Isobutyl Ketone	108-10-1	2.38
Naphthalene	91-20-3	0.00
Styrene monomer	100-42-5	0.21
Toluene	108-88-3	1.78
Xylenes (m, p, o isomers)	1330-20-7	6.17
	Total:	14.76

Note: Individual welding HAPs and natural gas combustions HAPs are not included in this table, because they are almost inconsequential for the permit. The individual HAPs from welding and natural gas combustion are different from those of the paint booths. These values are from paint spray booths 1 and 2 and the solvent usage used to clean sprayer lines in those booths.

PM-10 Potential to Emit

PM = PM10 emissions in the absence of supporting technical information on the particle size fractions.

Product Density	7.6	lb/gallon
Application Rate	6.8	gallon/hr
Number of spray guns	2	
Overspray	30	%
Pre-permit control efficiency	0	% (for pre-permit PTE)

Uncontrolled

Emission Rate = Product Density (lb/gal) x Application Rate (gal/hr) x # guns x overspray (%/100) x (1 - (control efficiency/100))

31.008 lb PM and PM10/hr
15.504 lb PM and PM10/hr per spray gun

Controlled Emissions

Product Density	7.6	lb/gallon
Application Rate	6.8	gallon/hr
Number of spray guns	2	
Overspray	30	%
Filter control efficiency	96	%

The manufacturer's guarantee for particulate control ranges from 85% to 96% control efficiency. Use of the highest efficiency warrants increased monitoring and recordkeeping of pressure drop across the filter and immediate replacement when the recommended pressure drop is reached.

Charmac's August 4, 2003 letter requests that each paint spray booth have potential PM-10 emissions accounting for the worst case white primer and paint usage.
That letter also requests that the annual PM-10 emissions rate be estimated using continuous operation (24 hours per day) for 365 days per year.
Daily allowable emissions would be estimated using continuous operation over a 24 hour period.
This approach will significantly overestimate annual and daily PM-10 emissions, if Charmac's process description is taken into account.

Emission Rate = Product Density (lb/gal) x Application Rate (gal/hr) x # guns x overspray (%/100) x (1 - (control efficiency/100))

1.24 lb PM-10 / hr BOTH spray guns

0.62 lb PM-10 / hr per spray gun or booth CONTROLLED

0.078 grams / second per spray booth

PM-10 Emissions

Paint Spray Booth #1	
Vent C	0.078 gram/sec
Paint Spray Booth #2	
Vent A	0.039 gram/sec
Vent B	0.039 gram/sec

Vents A and B on spray booth #2 exhaust emissions equally.

Pre-Permit PTE of Paint Spraying Operations: PM-10 Emissions

Assumptions: Worst case emissions rate for each spray gun, based upon white primer solids content. Charmac's 8/04/03 facility draft comments request that each booth be operational for 24 hours per day. This revised emission estimate DOES NOT take into account Charmac's process parameters for the length of time it is assumed painting and priming operations occur.
The single spray gun per booth is a critical assumption for PTE.

PM and PM-10 Emissions

Source	Number of Vents	Controlled PM/PM-10 Emissions (lb/hr)	Uncontrolled PM & PM-10 Emission Rate (lb/hr)	Requested Operating Hours Per Day	Operating Days per Year	Controlled Daily Emissions (lb/day)	Uncontrolled Annual Emissions (T/yr)	Controlled Annual Emissions (T/yr)
Paint Booth #1 - Vent C	1	0.62	15.5	24	365	14.88	67.91	2.72
Paint Booth #2 - Vent A	2	0.31	7.75	24	365	7.44	33.96	1.36
Vent B		0.31	7.75	24	365	7.44	33.96	1.36
			Controlled Paint Spray Emissions:			29.77	135.82	5.43

Based on the assumptions requested by Charmac in the August 4, 2003 comments on the facility draft permit
Pre-permit PTE for both paint spray booths is approximately 136 Tons per year. Controlled PTE is estimated to be 5.43 Tons per year.

ATTACHMENT D

DEQ Spreadsheet –

Welding and Natural Gas Combustion Emissions

COMBUSTION AND WELDING SECTION

Hourly Emission Rates for NOx from Space Heaters (Modeling Review)

Individual Unit Rated Heat Input Capacity (Btu/hr)	NOx Emission Factor (lb/E6 scf)	Hourly Emission Rate per unit (lb NOx/hr)	Number of Units at this Capacity	Hourly Emission (lb NOx/hr)
300000	94	0.0276	2	0.0553
125000	94	0.0116	1	0.0115
80000	94	0.0074	13	0.0968
75000	94	0.0069	10	0.0691
90000	94	0.0083	2	0.0166
100000	94	0.0092	4	0.0369
				0.2852 LB/HR TOTAL FOR ALL UNITS

Welding Emissions
Information taken from the January 6, 2002 submittal (modeling)

Welding emissions consist of PM-10 and HAPs (metal HAPs)
Welding rod usage provided by Charmac was 2001 actual rod usage, not necessarily requested PTE.
Hourly emissions rates assume 8760 hour per year operation. This minimizes the hourly rates.
GMAW stands for "gas metal arc welding" and this is the only method employed at Charmac's facility

Welding PM-10 Emissions

Electrode Type	PM-10 Emission Factor (lb/1000 lb of electrode)	Electrode Usage (lb/yr)	Emissions (lb/hr)	Rates (T/yr)
E70S (for tubular steel)	5.2	7767	0.005	0.020
ER5164 (for aluminum)	21.4	622	0.002	0.007

Potential # of Steel Trailers	2001 Actual # of Steel Trailers
4088	1194

Ratio of Requested Potential to Actual 2001
3.42
Scaled PM-10 Emission Rate for Steel Trailer Welding
0.016 lb/hr
PM-10 Emission Rate for Aluminum Trailer Welding (Actual 2001 unchanged)
0.002 lb/hr

Scaled Welding PM-10 Emissions
0.017 lb/hr

Welding HAPs Emissions

Electrode Type and annual emissions	Chromium (Cr) Emissions Factor	Cobalt (Co) Emissions Factor	Manganese (Mn) Emissions Factor	Nickel (Ni) Emissions Factor
E70S (lb/1000 lb rod)	0.001	0.001	0.318	0.001
Annual HAPs Emissions (T/yr)	3.89E-06	3.89E-06	1.24E-03	3.89E-06
ER5164 (for aluminum)	0.01	ND	0.034	ND
Annual HAPs Emissions (T/yr)	3.11E-06		1.06E-05	
Welding HAPs Totals	7.00E-06	3.89E-06	1.25E-03	3.89E-06

Aggregated HAPs: 1.26E-03 T/yr

Aggregated HAPs scaled to 4088 steel trailers + 88 aluminum trailers = 4.29E-03 T/yr

Modeled Emissions Rates PM-10 and NOx

Area Source	Provided X Dimension (meters)	Provided Y Dimension (meters)	Calculated Area (sq meters)	Provided PM-10 Emissions (grams/s-m^2)	Calculated PM-10 Emissions (lb/hr)	Provided NOx Emissions (grams/s-m^2)	Calculated NOx Emissions (lb/hr)
HEAT_3A	12.19	12.19	148.5961	9.26E-07	1.09E-03	7.90E-06	9.31E-03
HEAT_3B	42.67	30.48	1300.6816	9.26E-07	9.54E-03	7.90E-06	8.16E-02
HEAT_4	42.72	33.53	1432.4016	4.37E-07	4.96E-03	3.47E-06	3.94E-02
HEAT_5	10.65	121.86	1297.809	1.44E-06	1.48E-02	1.23E-05	1.27E-01
HEAT_6	9.15	15.24	139.446	2.89E-06	3.20E-03	2.47E-06	2.73E-02
WELD_3A	12.19	12.19	148.5961	1.78E-07	2.10E-04	NA	NA
WELD_3B	42.67	30.48	1300.6816	1.78E-07	1.84E-03	NA	NA
WELD_4	42.72	33.53	1432.4016	1.68E-07	1.91E-03	NA	NA
WELD_5	10.65	121.86	1297.809	1.98E-07	2.04E-03	NA	NA

	PM-10 (lb/hr)		NOx (lb/hr)
Heating Summary	3.36E-02		2.84E-01
Welding Summary	5.99E-03		NA

Charmac Trailers - Twin Falls **ATTACHMENT D**

T2-020412

Combustion Devices and Welding Emissions

HAPs and Criteria Air Pollutants Pre-Tier II OP Potential to Emit

Natural gas-fired combustion sources: Heaters

Heat Input Rating	Number of Units	Total Heat Input (Btu/hr)
300000	2	600000
126000	1	126000
80000	13	1040000
76000	10	760000
90000	2	180000
100000	4	400000

Facility-wide Natural Gas Combustion = 3096000 Btu/hr

Hourly Emission Rate (lb/hr) = (3,096,000 Btu/hr) * (1 scf / 1020 Btu) * (lb pollutant / 10^6 scf)

Annual Emission Rate (Tons/yr) = (Hourly Emissions Rate (lb/hr) * (8760 hr/yr) * (1 ton / 2000 lb)

Natural Gas Combustion PTE - Space Heaters (Aggregated)

Pollutants	Emission Factors (lb/E^6 scf)	Hourly Emissions (lb/hr)	Annual Emissions (T/yr)
Criteria Pollutants			
Lead (Pb)	0.0006	1.52E-06	6.66E-06
CO	40	1.21E-01	5.32E-01
NOx (as NO2)	94	2.85E-01	1.25E+00
PM (Total)	7.6	2.31E-02	1.01E-01
PM10 (condensible + filterable)	7.6	2.31E-02	1.01E-01
SO2	0.6	1.82E-03	7.97E-03
VOCs	5.5	1.67E-02	7.31E-02
HAPs			
2-Methylnaphthalene	2.40E-06	7.28E-09	3.19E-07
3-Methylchloranthrene	1.80E-06	5.46E-09	2.39E-08
7, 12 Dimethylbenz(a)anthracene	1.60E-05	4.85E-08	2.13E-07
Acenaphthene	1.80E-06	5.46E-09	2.39E-08
Acenaphthylene	1.80E-06	5.46E-09	2.39E-08
Anthracene	2.40E-06	7.28E-09	3.19E-08
Benz(a)anthracene	1.80E-06	5.46E-09	2.39E-08
Benzene	2.10E-03	6.37E-06	2.79E-05
Benzo(a)pyrene	1.20E-06	3.64E-09	1.59E-08
Benzo(b)fluoranthene	1.80E-06	5.46E-09	2.39E-08
Benzo(g,h,i)perylene	1.20E-06	3.64E-09	1.59E-08
Benzo(k)fluoranthene	1.80E-06	5.46E-09	2.39E-08
Chrysene	1.80E-06	5.46E-09	2.39E-08
Dibenzo(a,h)anthracene	1.20E-06	3.64E-09	1.59E-08
Dichlorobenzene	1.20E-03	3.64E-06	1.59E-05
Fluoranthene	3.00E-06	9.10E-09	3.99E-08
Fluorene	2.80E-06	8.50E-09	3.72E-08
Formaldehyde	7.50E-02	2.28E-04	9.97E-04
Hexane	1.80E+00	5.46E-03	2.39E-02
Indeno(1,2,3-cd)pyrene	1.80E-06	5.46E-09	2.39E-08
Naphthalene	6.10E-04	1.85E-06	8.11E-06
Phenanthrene	1.75E-05	5.31E-08	2.33E-07
Pyrene	5.00E-06	1.52E-08	6.65E-08
Toluene	3.40E-03	1.03E-05	4.52E-05
Arsenic	2.00E-04	6.07E-07	2.66E-06
Beryllium	1.20E-05	3.64E-08	1.59E-07
Cadmium	1.10E-03	3.34E-06	1.46E-05
Chromium	1.40E-03	4.25E-06	1.86E-05
Cobalt	8.40E-05	2.55E-07	1.12E-06
Manganese	3.80E-04	1.15E-06	5.05E-06
Mercury	2.60E-04	7.89E-07	3.46E-06
Nickel	2.10E-03	6.37E-06	2.79E-05
Selenium	2.40E-05	7.28E-08	3.19E-07
	Annual Aggregated HAPs:		**2.51E-02** T/yr

Natural Gas Combustion HAPs	
Aggregated HAPs Subtotal =	0.026 tons/year

APPENDIX C

Charmac Trailers, Twin Falls
Tier II Operating Permit and Permit to Construct
No. T2-020412

Modeling Technical Memorandum

MEMORANDUM

TO: Harbi Elshafei, Air Permit Analyst, Air Program Division
Mary Anderson, Air Modeling Coordinator, Air Program Division

FROM: Kevin Schilling, Air Quality Scientist, State Office of Technical Services

SUBJECT: Atmospheric Dispersion Modeling Review for the Charmac Trailers PTC/Tier II Operating Permit

DATE: September 2, 2003

1.0 SUMMARY:

Charmac Trailers (Charmac) submitted a Tier II operating permit application for their trailer manufacturing facility in Twin Falls, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions were submitted in support of the Tier II application to demonstrate that the stationary source would not cause or significantly contribute to a violation of the PM_{10} ambient air quality standard (IDAPA 58.01.01.403.02).

The Department of Environmental Quality (the Department) received a revised *Air Quality Impact Analysis* as part of their PTC/Tier II application from Charmac on February 18, 2003. Tetra Tech EM Inc. (Tetra Tech), Charmac's consultant, conducted the ambient air quality analyses for the application. Facility-wide emissions of oxides of nitrogen (NOx) and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}) were used to demonstrate compliance with IDAPA 58.01.01.403.02. The application was declared complete by the Department on May 14, 2003.

A technical review of the submitted air quality analyses was conducted by the Department's Technical Services Division. The Department made several adjustments to the emissions inventory and to dispersion modeling methods used. The modeling analyses, with identified adjustments conducted by the Department: 1) utilized appropriate methods and models; 2) was conducted using proper model parameters and accurate input data; 3) adhered to established Departmental guidelines for new source review dispersion modeling; 4) demonstrated that predicted pollutant concentrations from facility-wide emissions, when appropriately combined with background concentrations, were below applicable air quality standards.

2.0 DISCUSSION:

2.1 Applicable Air Quality Impact Limits and Required Analyses

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The Charmac facility is located in Twin Falls County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). There are no Class I areas within 10 kilometers of the facility.

2.2.2 Significant Impact and Full Impact Analyses

If estimated maximum impacts to ambient air from the emissions sources associated with the proposed modification exceed the "significant contribution" levels of IDAPA 58.01.01.006.93, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.403.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to Department-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 1. Table 1 also lists significant contribution levels and specifies the modeled value that must be used for comparison to the NAAQS.

Table 1. Applicable regulatory limits

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1[st] highest[g]
	24-hour	5.0	150[h]	Maximum 6[th] highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2[nd] highest[g]
	1-hour	2,000	40,000[j]	Maximum 2[nd] highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1[st] highest[g]
	24-hour	5	365[j]	Maximum 2[nd] highest[g]
	3-hour	25	1,300[j]	Maximum 2[nd] highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1[st] highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1[st] highest[g]

a. IDAPA 58.01.01.006.93
b. Micrograms per cubic meter
c. IDAPA 58.01.01.577 for criteria pollutants, IDAPA 58.01.01.585 for non-carcinogenic toxic air pollutants IDAPA 58.01.01.586 for carcinogenic toxic air pollutants.
d. The maximum 1[st] highest modeled value is always used for significant impact analysis and for all toxic air pollutants
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
f. Never expected to be exceeded in any calendar year
g. Concentration at any modeled receptor
h. Never expected to be exceeded more than once in any calendar year
i. Concentration at any modeled receptor when using five years of meteorological data
j. Not to be exceeded more than once per year

2.2.3 Toxic Air Pollutant Impact Analysis

Toxic Air Pollutant (TAP) requirements for PTCs are specified in IDAPA 58.01.01.210. If the net emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of IDAPA 58.01.01.585 and IDAPA 58.01.01.586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of IDAPA 58.01.01.585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of IDAPA 58.01.01.586, then compliance with TAP requirements has been demonstrated.

Tetra Tech submitted dispersion modeling analyses for Aluminum, Calcium Carbonate, and Potassium Hydroxide. These analyses of TAPs were not reviewed by the Department because all emissions sources were in operation prior to July 1, 1995[1], thereby exempting those sources from TAP review under Section 210.

1 Per directive from the Air Program Division, in accordance with the definition of Net Emissions Increase for TAPs (IDAPA 58.01.01. 007.06.c)

2.2 Background Concentrations

Background concentrations were revised for all of Idaho by the Department in March 2003[2]. An air quality monitor for PM_{10} is located in Twin Falls, and background values were based on results obtained from this monitor. Background concentrations for other pollutants in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Tetra Tech used the Twin Falls value for background PM_{10}, as provided by the Department. Background concentrations for NO_2 were not used in Tetra Tech's analyses. The Department used default background NO_2 values for small town/suburban areas. Table 2 lists the background concentrations appropriate for the Charmac facility.

Table 2. Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	55
	Annual	26
NO_2[c]	Annual	32

a. Micrograms per cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
c. Nitrogen dioxide

2.3 Modeling Impact Assessment

Table 3 provides a summary of the modeling parameters used for the Department's analyses.

Table 3. Modeling Parameters

Parameter	Description/Values	Documentation/Additional Description
Model	ISC-PRIME	Version 99020
Meteorological data	Heyburn Surface Data Boise Upper Air Data	Sept. 2000 – Aug 2001. Tetra Tech submitted analyses using Boise surface and upper air data
Model options	Regulatory Default	
Land use	Rural	Low population density in area and large fraction of unimproved land
Terrain	Considered	Not considered in application submitted
Building downwash	Used building profile input program for ISC-PRIME (BPIP-PRIME)	Building dimensions obtained from modeling files submitted
Receptor grid	Grid 1	25 meter spacing along boundary out to 100 meters
	Grid 2	50 meter spacing out to about 250 meters
	Grid 3	100 meter spacing out to about 1,000 meters
	Grid 4	200 meter spacing out to about 3,000 meters
Facility location (UTM)[a]	Easting	706 kilometers
	Northing	4,714 kilometers

a. Universal Transverse Mercator

2.3.1 Modeling protocol

A modeling protocol was not submitted to the Department prior to the application.

2 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling.* Memorandum to Mary Anderson, March 14, 2003.

2.3.2 *Model Selection*

Ambient air impact analyses were performed by Tetra Tech, Charmac's consultant, using the model ISC-PRIME. The Department concurs with Tetra Tech's selection of ISC-PRIME for these dispersion modeling analyses.

2.3.3 *Land Use Classification*

Although the facility is located within the town of Twin Falls, over 50 percent of the landuse of the surrounding 3.0-kilometer area is rural. Therefore, rural dispersion coefficients were used in the modeling analyses.

2.3.4 *Meteorological Data*

Tetra Tech originally used surface and upper air meteorological data from Boise, Idaho. The Department possesses one year of surface meteorological data from Heyburn, Idaho, for September 2000 through August 2001. The Department determined that the Heyburn data are more representative of the Twin Falls area than meteorological data from Boise. Upper air data from Boise were still used in the analyses. The Department determined the Heyburn surface data with Boise upper air data are the most representative data available for the area.

2.3.5 *Complex Terrain*

The model was run by Tetra Tech assuming flat terrain. The Department reviewed 7.5 minute USGS maps and was not completely confident that terrain could be neglected. The Department used USGS 7.5 minute Digital Elevation Model (DEM) files to obtain elevations of receptors, sources, and buildings. The following DEM files were used in the analyses:

- Twin Falls 8252_75.dem
- Filer 8254_75.dem

2.3.6 *Facility Layout*

The Department verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application.

2.3.7 *Building Downwash*

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program for ISC-PRIME (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters. Departmental verification modeling was conducted using regenerated parameters from BPIP-PRIME.

2.3.8 *Ambient Air Boundary*

Tetra Tech indicated in the application that ambient air was considered as that area external to the facility fenceline.

2.3.9 *Receptor Network*

The originally submitted modeling analyses from Tetra Tech utilized the following receptor grid:

- 25-meter spacing along the ambient air boundary out to about 100 meters
- 100-meter spacing out to about 900 meters
- 500-meter spacing out to about 4,000 meters

The Department slightly modified the grid because of the close proximity of emissions sources to the ambient air boundary. The following is the Department's revised grid:

- 10-meter spacing along the ambient air boundary out to about 50 meters
- 25-meter spacing out to about 100 meters
- 50-meter spacing out to about 250 meters
- 100-meter spacing out to about 1,000 meters
- 200-meter spacing out to about 3,000 meters

2.3.10 *Emission Rates*

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application, the Department's emission inventory review, and the proposed permit. The following approach was used for the Department's verification modeling:

- All modeled emissions rates were equal to the facility's emissions calculated in the Tier II application or the permitted allowable rate, whichever was greater.

- Modeling results were compared to "significant contribution" thresholds. More extensive review of modeling parameters was not necessary because model results were well below applicable standards.

Table 4 provides criteria pollutant emissions quantities for short-term and long-term averaging periods. Tetra Tech did not calculate emissions rates for CO, SO_2, and lead. Emissions rates for these pollutants are estimated to be negligible because the only sources of these pollutants at the facility are natural gas-fired heaters.

The Department's review of the emissions inventory indicated that potential PM_{10} emissions from welding activities should be increased by a factor of 3.42. Tetra Tech based emissions on 2001 actual welding rod usage rather than potential usage. Welding PM_{10} rates used in the Department's verification modeling were equal to Tetra Tech's rates multiplied by 3.42.

Heater emissions from Building 5 were modeled by Tetra Tech as a single, elevated area source. The Department did not concur that this approach was the most appropriate for the emissions source. Therefore, the Department's verification modeling was performed by modeling this emissions source as 10 separate volume sources to account for the long, narrow building shape. Section 2.3.11 below describes the reasons for modeling the source as a volume source rather than an area source.

2.3.11 *Emission Release Parameters*

Table 5 provides emissions release parameters, including stack location, stack height, stack diameter, exhaust temperature, and exhaust velocity. All heating and welding emissions were modeled by Tetra Tech as elevated area sources. The Department questioned whether this approach was appropriate because the effects of plume downwash, caused by the presence of buildings in close proximity to the emissions release point, are not accounted for. Downwash effects are likely to be an important consideration in this instance because ambient air receptors are located at a very close distance from emissions sources and buildings. Plume downwash will result in increased initial dispersion of the plume.

This will cause higher concentrations at receptors close to buildings and reduced concentrations at more distant receptors. To simulate this effect, the Department determined that modeling the emissions as a volume source would be most appropriate. The initial dimensions of the plume were set at the minimum horizontal and vertical dimensions of the building from which the emissions originate. The release height was set at the midpoint of the buildings.

Table 4. PM_{10} Emissions Rates Used for Modeling

Source (Id Code)	Location (meters)	Hourly Rate Used for Modeling (lb/hr)[a]	
		PM_{10}[b]	Nox[c]
Paint spray booth #2 (VENT_A)	E706270 N4713752	0.310	0.0
Paint spray booth #2 (VENT_B)	E706277 N4713752	0.310	0.0
Paint spray booth #1 (VENT_C)	E706268 N4713732	0.620	0.0
Heaters in Bldg 5 (HEAT_51)	E706343 N4713697	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_52)	E706343 N4713709	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_53)	E706342 N4713721	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_54)	E706341 N4713733	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_55)	E706340 N4713746	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_56)	E706340 N4713758	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_57)	E706338 N4713770	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_58)	E706337 N4713782	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_59)	E706337 N4713794	1.48E-03	1.27E-02
Heaters in Bldg 5 (HEAT_510)	E706336 N4713806	1.48E-03	1.27E-02
Welding in Bldg 5 (WELD_51)	E706343 N4713697	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_52)	E706343 N4713709	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_53)	E706342 N4713721	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_54)	E706341 N4713733	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_55)	E706340 N4713746	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_56)	E706340 N4713758	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_57)	E706338 N4713770	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_58)	E706337 N4713782	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_59)	E706337 N4713794	6.97E-04 (2.039E-04)[d]	0.0
Welding in Bldg 5 (WELD_510)	E706336 N4713806	6.97E-04 (2.039E-04)[d]	0.0
Heaters in Bldg 4 HEAT_4A	E706241 N4713786	4.97E-03	4.25E-02
Welding in Bldg 4 WELD_4A	E706241 N4713786	6.53E-03 (1.91E-03)[d]	0.0
Heaters in Bldg 6 HEAT_6A	E706224 N4713747	3.20E-03	2.73E-02
Heaters in Bldg 3A HEAT_3AA	E706279 N4713687	1.09E-03	9.32E-03
Welding in Bldg 3A (WELD_3AA)	E706279 N4713687	7.18E-04 (2.10E-04)[d]	0.0
Heaters in Bldg 3B HEAT_3BA	E706294 N4713710	9.55E-03	8.16E-2
Welding in Bldg 3B (WELD_3BA)	E706294 N4713710	6.28E-03 (1.84E-03)[d]	0.0

a. Pounds per hour
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
c. Oxides of nitrogen
d. The Department adjusted the emissions inventory. The emissions rate submitted by Tetra Tech is listed in parentheses.

Table 5. Emissions and Stack Parameters

Release Point / Location	Source Type	Stack Height (m)[a]	Modeled Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
VENT_A	Point	4.5700	1.1910	293	0.00100
VENT_B	Point	4.5700	1.1910	293	0.00100
VENT_C	Point	4.8800	1.3760	293	5.7200
Volume and Area Sources	**Source Type**	**Release Ht. (m)**	**Initial σ_y (m)**	**Initial σ_z (m)**	
HEAT_51	Volume	3.048	4.97	2.83	
HEAT_52	Volume	3.048	4.97	2.83	
HEAT_53	Volume	3.048	4.97	2.83	
HEAT_54	Volume	3.048	4.97	2.83	
HEAT_55	Volume	3.048	4.97	2.83	
HEAT_56	Volume	3.048	4.97	2.83	
HEAT_57	Volume	3.048	4.97	2.83	
HEAT_58	Volume	3.048	4.97	2.83	
HEAT_59	Volume	3.048	4.97	2.83	
HEAT_510	Volume	3.048	4.97	2.83	
WELD_51	Volume	3.048	4.97	2.83	
WELD_52	Volume	3.048	4.97	2.83	
WELD_53	Volume	3.048	4.97	2.83	
WELD_54	Volume	3.048	4.97	2.83	
WELD_55	Volume	3.048	4.97	2.83	
WELD_56	Volume	3.048	4.97	2.83	
WELD_57	Volume	3.048	4.97	2.83	
WELD_58	Volume	3.048	4.97	2.83	
WELD_59	Volume	3.048	4.97	2.83	
WELD_510	Volume	3.048	4.97	2.83	
HEAT_4A	Volume	3.048	7.8	2.83	
WELD_4A	Volume	3.048	7.8	2.83	
HEAT_6A	Volume	4.572	2.13	4.25	
HEAT_3AA	Volume	3.048	2.83	2.83	
WELD_3AA	Volume	3.048	2.83	2.83	
HEAT_3BA	Volume	3.048	7.09	2.83	
WELD_3BA	Volume	3.048	7.09	2.83	

a. Meters
b. Kelvin
c. Meters per second

3.0 MODELING RESULTS:

This Section describes dispersion modeling results.

3.1 Significant and Full Impact Analysis Results

The applicant conducted a Full Impact Analysis and did not conduct a separate preliminary Significant Impact Analysis. Results of the Full Impact Analysis (the Department's verification analysis) are presented in Table 6 and Table 7. All impacts are well below NAAQS for both the analyses submitted by Tetra Tech and the Department's verification modeling, including adjustments to modeling parameters used by Tetra Tech.

Table 6. Criteria pollutant design concentrations for full impact analysis

Pollutant	Averaging Period	Year	Design Concentration (μg/m³)[a]	Receptor Location (meters)[a]	
				Easting (m)	Northing (m)
PM_{10}[b]	24-hour	2000	46.3 (46.6)[c]	706215	4713730
	Annual	NA	11.5 (12.7)[c]	706346	4713736
NO_2[d]	Annual	NA	7.9 (1.41)[c]	706355	4713753

a. Micrograms per cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
c. The value in parentheses is the value obtained from the analysis performed by Tetra Tech
d. Nitrogen dioxide

Table 7. Full impact analysis results

Pollutant	Averaging Period	Total Ambient Impact[a] (μg/m³)[b]	Background Concentration (μg/m³)	Total Ambient Concentration (μg/m³)	NAAQS (μg/m³)	Percent of NAAQS
PM_{10}	24-hour	46.3	55	101.3	150	68
	Annual	11.5	26	37.5	50	75
NO_2[c]	Annual	7.9	32	39.9	100	40

a. Impact from facility-wide emissions
b. Micrograms per cubic meter
c. Nitrogen dioxide

3.2 Toxic Air Pollutants Results

Modeling of TAPs was not necessary.

4.0 FILES

Electronic copies of the modeling analysis are saved on disk. Table 8 provides a summary of the files used in the modeling analysis. The Permit Writer has reviewed this modeling memo to ensure consistency with the permit and technical memorandum.

Table 8. Dispersion Modeling Files		
Type of File	**Description**	**File Name**
Met data	Surface data from Heyburn, Idaho Upper air data from Boise, Idaho	HEYBFINAdjust.MET
BEEST input files	24-hour and Annual	Charmac24Hr.BST
Each BST file has the following type of files associated with it:		
	Input file for BPIP program	.PIP
	BPIP output file	.TAB
	Concise BPIP output file	.SUM
	BEE-Line file containing direction specific building dimensions	.SO
	ISCST3 input file for each pollutant	.DTA
	ISCST3 output list file for each pollutant	.LST
	User summary output file for each pollutant	:USF
	Master graphics output file for each pollutant	.GRF
Some modeling files have the following type of graphics files associated with them:		
	Surfer data file	.DAT
	Surfer boundary file	.BLN
	Surfer post file containing source locations	.TXT
	Surfer plot file	.SRF

KS: G:\TECHNICAL SERVICES\MODELING\SCHILLING\CHARMACTIERII\CHARMAC MODELING MEMO1.DOC

APPENDIX D

Charmac Trailers, Twin Falls
Tier II Operating Permit and Permit to Construct
No. T2-020412

Tier II Operating Permit Fee Calculations

Tier II Fee Calculation

Instructions:
Insert the following information and answer the following questions either Y or N. Insert the permitted emissions in tons per year into the table. TAPS only apply when the Tier II is being used for New Source Review.

Company: Charmac Trailers
Address: 452 South Park Avenue
City: Twin Falls
State: Idaho
Zip Code: 83303
Facility Contact: Lloyd Casperson
Title: President
AIRS No.: 083-00068

N Did this permit meet the requirements of IDAPA 58.01.01.407.02 for a fee exemption Y/N?

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

N Is this a syntheric minor permit? Y/N

Emissions Inventory	
Pollutant	Permitted Emissions (T/Y)
NO_X	0.0
PM10	5.4
PM	0.0
SO_2	0.0
CO	0.0
VOC	29.0
HAPS/TAPS	0.0
Total:	34.5
Fee Due	$ 5,000.00

Comments: Tier II operating permit processing Fee.

APPENDIX E

Charmac Trailers, Twin Falls
Tier II Operating Permit and Permit to Construct
No. T2-020412

AIRS/AFS Facility Information

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIPS	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2	B						U
NO_x	B						U
CO	B						U
PM_{10}	B						U
PT (Particulate)	B						U
VOC	B						U
THAP (Total HAPs)	B						NA
			APPLICABLE SUBPART				

<u>AIRS/AFS Classification Codes</u>

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant that is below the 10 tons per year threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).